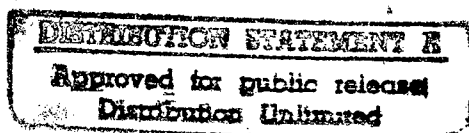




**FOREIGN
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JPRS Report

Environmental Issues



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Environmental Issues

JPRS-TEN-93-010

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EC Calls For Stricter Reactor Safety Measures in Eastern Europe

93MI0442Z Bonn DAS PARLAMENT in German
5 Mar 93 p 11

[Text] The nuclear power stations in central and eastern Europe are dangerous powder kegs and a threat to all the peoples of Europe. Although this hazard has been known at least since the Chernobyl disaster, there has been hardly any improvement in reactor safety. Although the Western countries' many initiatives lead to studies and the appointment of teams of experts, practical assistance on any large scale has so far come only from the European Community, and the International Atomic Energy Organization (IAEA) in Vienna, has concluded a report by the Council of Europe in Strasbourg.

For example, by the end of 1992, the EC had provided ECU200 million in an emergency aid program to allow safety measures to be taken in the most urgent cases, such as Kizlouy in Bulgaria. But overall, the Council of Europe investigation concludes that the western countries' political stance in this matter is largely determined by their own nuclear power station builders' lobby rather than by a clear analysis of the future needs of the countries concerned, many of them being dependent on atomic energy for as much as 50 percent of their power supply.

The Council of Europe therefore called on the governments of its member states to step up cooperation on nuclear power station repair in central and eastern Europe. Safety could be improved quickly and without great cost in an initial stage by tightening up inadequate laws and regulations, improving staff motivation and training, and forming partnerships between nuclear power stations in East and West under special International Atomic Energy Agency (IAEA) programs.

Bringing every reactor under construction up to international safety standards will have priority in nuclear power station modernization. Cost benefit analysis should be used to decide whether nuclear plants already in operation will continue to operate. If a temporary shutdown is required for modernization, any shortfall in the power supply should be made good by the other states.

From Alarming to Dangerous

However, the biggest problem was the shutdowns essential for 15 to 20 first-generation Soviet-designed reactors. The report classifies their condition as "from fairly alarming to dangerous." To deal with this difficult task, the Parliamentary Assembly proposes setting up high level decision-making machinery with extensive powers; it would decide priorities and work in close cooperation with national authorities to license individual programs and recommend shutdowns where necessary. Representatives of the European Bank for Reconstruction and Development and the IAEA should be involved.

The basis for this decision-making committee could be an international treaty on nuclear safety, which would set out the basic rules for a division of responsibility between planners, enterprises, and operating companies, and at the same time lay down governmental obligations. However, such a rigorous program of permanent or temporary shutdowns can only be considered if the requisite conditions

are created for plugging the power supply gap in the countries concerned. A European energy charter with the prime objective of promoting the exchange of raw materials and technology would be a first step towards a pan-European energy policy. The charter would have to be complemented by the creation of a European grid to underpin the electricity supply, and which could also temporarily connect national grids with each other. It was also urgent to increase the International Atomic Energy Agency's resources, which were constantly overstretched by its aid measures for countries in central and eastern Europe.

Criminal Neglect

Introducing his report, rapporteur Phillipe Bassinet (Socialist/F) pointed out that nuclear power station safety in eastern Europe had been neglected because of the tremendous economic problems. He stressed that his report was not a basis for a debate for or against nuclear power, but dealt solely with improving safety. And the conclusion could only be that a tremendous amount of money would have to be spent to prevent further disasters. Moreover, presentation of the report on eastern Europe did not mean that safety standards in the West were perfect. There was no uniform international standard for judging the safety of nuclear power stations.

The safety issue was all the more serious because in the former Soviet Union power stations were often operated by largely untrained personnel because many of the technical experts had left the countries concerned. The requisite safety standards therefore had to be laid down in cooperation with the International Atomic Energy Agency, and the resources also had to be found to implement those standards rapidly. The rapporteur advocated the formation of an independent monitoring committee, as the individual states could not always be trusted to enforce the high standards. Seventy percent of the money so far used to improve the safety of eastern atomic reactors had been provided by the European Community.

Bulgarian MP Luchezar Toshev (Union of Democratic Forces) took the view that it was virtually impossible to make existing Soviet-built atomic power stations any safer. In his country, for example, a reactor had nearly exploded only three months after it had been modified with EC assistance. The future had to belong only to renewable energy sources. It was important that the European Bank for Reconstruction and Development support this power supply changeover while at the same time helping to improve the safety of existing power plants. Unfortunately, the IAEA was not an independent organization.

Balanced Recommendations

Speaking by virtue of her special guest status, Svetlana Umetshaya (Independent/Russia) welcomed the report's balanced recommendations. If accepted by the governments, they could reduce the impending risk of accidents. The Commission of the European Communities had listed more than 200 plants in Eastern Europe whose safety needed to be improved. It was clear that the European Community must transfer its technology and standards to

the Russian standards. But the powerful nuclear lobby in Russia and the West was not being exactly helpful in achieving this objective.

Peter Meszaros (Democratic Forum/Hungary) believed it was essential to distinguish clearly between the first generation of plants, which ought to be closed as soon as possible, and the second generation. Safety could be guaranteed not only by better design, but also by intensive

training and the exchange of experience. Kaarina Dromberg (National Coalition/Finland) contradicted this. Studies by experts from her country had shown that reactors of more recent design were by no means automatically safer than the older ones. The Finnish government had made funds available to examine safety in Russian nuclear power stations and develop a common energy policy for the region together with its neighbors. But the current situation in Finland prevented greater investments in its neighbor country.

AFRICA

ANGOLA

UN Official Predicts Famine by September

MB0204181793 Johannesburg SABC TV 1 Network in English 1800 GMT 1 Apr 93

[Text] There will be famine in September in war-torn Angola even if the war ends tomorrow. That's according to Mercedes Sayageus, southern African representative of the UN's World Food Program [WFP]. While world bodies continue their efforts to broker peace in the region, the people of Angola may be starving by September. This report by Karen Mugglestone:

[Mugglestone] The continuing Angolan war has disrupted planting and harvesting and has also caused a shortage of seed and implements. Existing crops are looted by troops, or many fields have been mined. The UN's World Food Program is already providing more than 5,000 tonnes of food per month in Angola. The chief recipients of aid are displaced people, wandering from town to town to escape the fighting. Increased numbers of refugees are forcing the WFP to expand their fleet of planes with a further five cargo aircraft to transport food. WFP officials say although the situation isn't as bad as Somalia yet, Angola faces famine by September.

Meanwhile, the U.N. is trying to broker a daily so-called two-hour time of tranquility with UNITA [National Union for the Total Independence of Angola] and the Angolan Government. This would enable them to carry out need assessment missions in order to provide aid. Huambo, which fell to UNITA after weeks of furious fighting, is one of the towns affected. UNITA has since requested food aid for the town. However, Cuito, east of

Huambo, may not be so lucky. Three UN employees, their families, and thousands of residents, are stuck in the town which is being pounded by UNITA's long-range artillery.

[Begin Sayageus recording] It's like a mini Huambo. The government troops are crowded in a very small downtown area, while UNITA has conquered the birios [wards]. They are advancing onto downtown, and they are fighting house by house and street by street. Cuito is completely surrounded by UNITA, so there's no way to escape. [end recording]

SOUTH AFRICA

Drought Affecting Orange Free State Agriculture

MB0304073493 Johannesburg SAPA in English 0139 GMT 3 Apr 93

[Text] Bloemfontein April 2 SAPA—Agricultural conditions in parts of the Orange Free State are causing alarm, Free State Agricultural Union general manager Lullu de Jager said in Bloemfontein on Friday.

Worst hit is the western Free State. In Bainsvlei, west of Bloemfontein, there is a lack of moisture in wheat lands, and it will not be possible for farmers to plant at the end of April and in May—the most suitable time.

Problems are also being experienced in preparing land in other wheat areas throughout the Free State because of insufficient moisture.

Good rain would drastically improve the situation.

Mr. de Jager said the Free State produces about half the almost two million tons of wheat usually grown in South Africa.

Jiangsu Plants Trees To Improve Environment

*OW0204103993 Beijing XINHUA in English
0937 GMT 2 Apr 93*

[Text] Nanjing, April 2 (XINHUA)—More than 70 percent of the plains in east China's Jiangsu Province have been afforested, which, in turn, has helped improve the local environment, enhancing attractions for foreign investors.

Officials said that some 61 counties, accounting for 74 percent of the total land area of the coastal province, have reached the national standard for afforestation in plain areas.

Jiangsu, which has few hills, is composed predominantly of plains. Officials said afforestation has helped the province attract more foreign investors who now have a better environment to live in.

There are now some 470,000 hectares of forests in the plains of Jiangsu. A province-wide forest network, now taking shape, features a coastal shelterbelt, fruit groves on the northern bank of the Huaihe river and assorted forests along the Yangtze river.

Low-lying land in the lixiahe areas has benefitted much from the afforestation project.

Depressed areas have been opened as fishing pools. Local farmers have planted trees on the banks and raise ducks in the pools.

Meanwhile, fast-growing trees are being planted in such major cities as Xuzhou, Huaiyin, Nanjing and Zhenjiang. Some 33,000 hectares of poplars, paulownias and China firs already decorate these areas.

As a result, a number of tourism spots, high-grade villas, holiday resorts and forest parks have been set up in Suzhou, Wuxi, Changzhou and Nanjing.

Officials said an increasing number overseas tourists are visiting these areas and that some are investing in the province.

The number of foreign-funded enterprises in Jiangsu has topped 10,000, second in scale only to south China's Guangdong Province.

Project Reportedly Conserves Water, Soil Along Yangtze

*OW0304130993 Beijing XINHUA in English
1229 GMT 3 Apr 93*

[Text] Yichang, April 3 (XINHUA)—A state key project to control water loss and soil erosion along the Yangtze Valley has made substantial achievements.

The project, started four years ago, has harnessed 795 of the Yangtze River's branches across 78 counties and cities

and protected 22,600 sq km of soil, according to the Yangtze River Water and Soil Conservation Bureau.

Besides, the shelterbelt in the area has accumulated to 746,000 ha.

Due to adverse natural conditions and indiscriminate logging, the upper reaches of the Yangtze have been severely affected by water loss and soil erosion.

In 1992 alone nearly eight million tons of soil was protected.

The afforestation in the Three Gorges reservoir zone has not only improved the local ecological environment but also raised production conditions in the resettlement area.

Statistics collected from 10 counties in the reservoir zone show that, the improved environment can sustain an increase in population of 121,000.

What has been done is only a small part of the huge undertaking, which is planned to cover a total area of 350,000 sq km of the upper reaches of the Yangtze.

Government Circular Calls For Cooperation Among Environmental Agencies

*OW0704075593 Beijing XINHUA in English
0359 GMT 7 Apr 93*

[Text] Beijing, April 7 (XINHUA)—The Chinese State Council, the central government, recently issued a circular on enhancing environmental protection and cracking down on illegal activities in the field.

The circular said that environmental protection is one of China's basic state policies, and the council has formulated a series of laws, regulations and policies and measures for the purpose.

It noted that the central task for protection of the environment is to enhance supervision over the implementation of these laws and regulations, and to deal with illegal activities which result in grave pollution and severe damage to the ecology.

It called on governments at all levels to put environmental protection at the top of their agenda and to enhance implementation of the laws.

It said that the governments should report their performances on implementing the laws on environmental protection to the people's congresses at the same and superior levels.

The circular called for joint efforts by the departments of environmental protection, forestry, agriculture, water conservancy, construction, industry and commerce, foreign trade, public security and the press to commit their obligations, and in dealing with severe illegal cases.

JAPAN

RITE Report from GLENTEX '92 Global
Environmental Conference

Steel Industry's International Cooperation

93WN0240A Tokyo CHIKYU KANKYO KAIGI
GLENTEX '92 SEMINA in Japanese 26 Nov 92 p 35

[Text]

Steel Industry

International Cooperation Through Energy Conservation
and Environmental Measures

As the steel industry's efforts to internationally contribute to and cooperate in the field of global environmental protection, we can cite its energy saving measures and its environmental protection measures designed to deal with SOx and NOx pollutants.

The first Oil Shock of 1973 proved a turning point for the steel industry. Since then, the industry has pursued its energy conservation policy vigorously in various areas, viz., equipment, technology, and operations. As a result, the industry has been able to improve its own energy-use efficiency (the amount of energy consumed per 1 ton of crude steel) by some 20% over the 1973 figures. In the area of environmental protection, the industry implemented the following SOx measures: (1) low sulfurization of raw materials and fuels, (2) desulfurization of coke oven gas, and (3) desulfurization of sintered exhaust gases. As a result, the level of SOx emissions in steel plants have been reduced to 1/5th the previous amount. Moreover, the industry implemented the following NOx measures, which served to reduce substantially the level of NOx emissions as well: (1) low air ratio combustion, (2) use of low NOx emission burners, and (3) promotion of an energy conservation policy. In addition to these, the industry also has

taken vigorously measures designed to deal with soot, dust, and coarse particulates as well as measures for treatment of water.

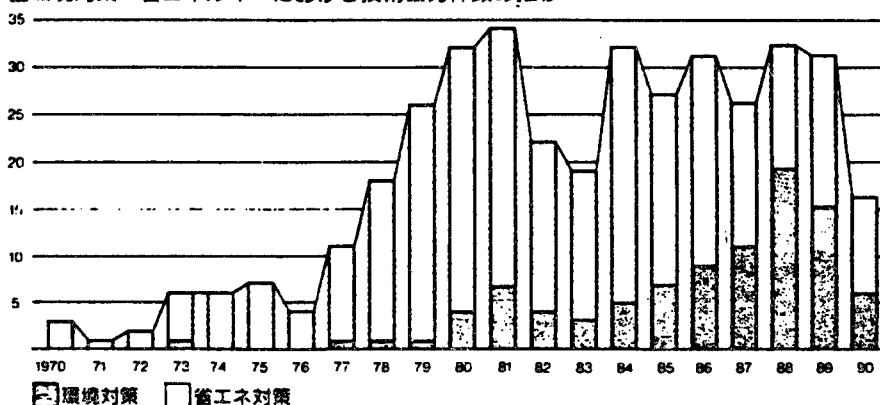
As a result of its cooperative efforts in energy conservation and environmental protection measures, Japan's steel industry has accumulated a wealth of technology and practical experience, which the industry has put to use in providing technical cooperation in response to requests received from various overseas countries.

First of all, let us consider energy-saving technology. During the past 20 years, the steel industry was involved in as many as 360 technical cooperative projects, in both advanced and developing nations, covering a wide variety of areas ranging from the construction of iron mills to provision of operational guidance, facility diagnostics, and in-service technical trainee programs.

In the area of environmental technology, also, as developing countries increasingly are becoming industrialized, environmental problems are becoming more serious, creating rising expectations for Japan's technological capabilities in this field. In these circumstances, the Japan Iron and Steel Federation played an active role in various international cooperation projects. For instance, in 1987, jointly with the United Nations Environmental Planning Agency, the federation held an environmental technology in-service-training institute for ten Asian countries; and, again, in 1989, the federation provided environmental managers for Brazilian steel plants with in-service-training in Japan. The number of cases in which individual companies undertook technical cooperation programs in recent years totaled 110. Since international cooperation through energy-conservation and environmental-protection measures will assume increasing importance in the future, the steel industry intends to implement still further technical cooperation, thus contributing to the international cause of global environmental protection.

Shift in Number of Technical Cooperation Projects in the Environmental Protection and Energy Conservation Fields
(社団法人日本鉄鋼連盟)

環境対策・省エネルギーにおける技術協力件数の推移

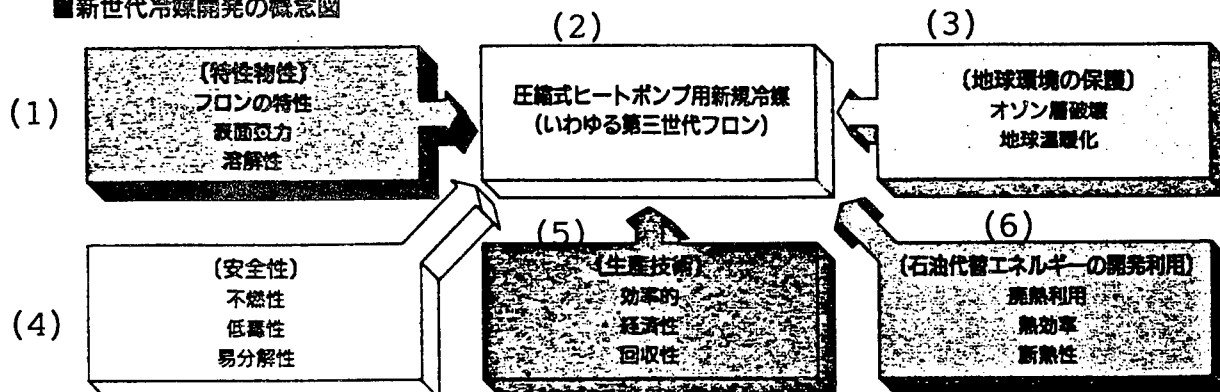


(1) (2)

Key:-)1. Environmental protection measure 2. Energy conservation measure

Conceptual Diagram of the New Generation Refrigerant Development

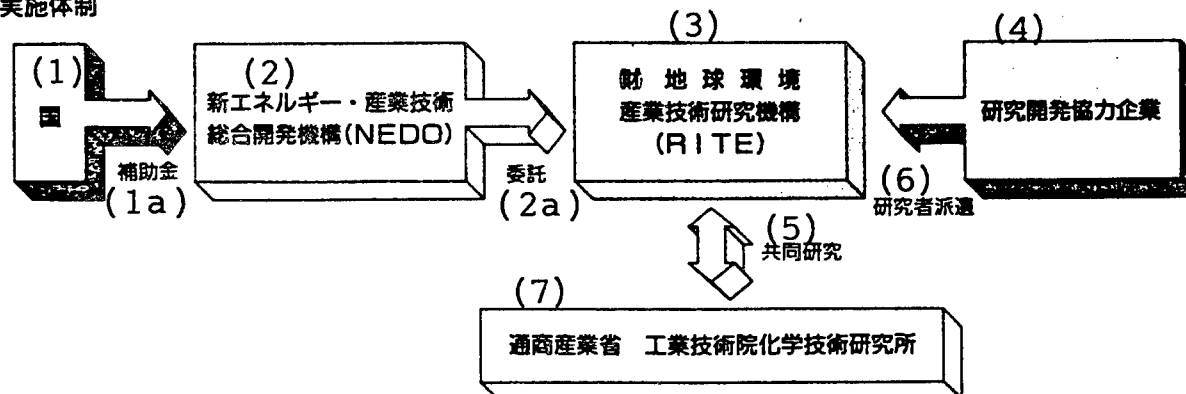
■新世代冷媒開発の概念図



Key:-)1. (Material characteristics) CFC characteristics: surface tension and solubility 2. New Refrigerant for use in compression heat pump (so-called third generation CFC) 3. (Protection of global environment): Destruction of the ozone layer and global warming 4. (Safety): Non-combustion, non-toxic, and easy to decompose 5. (Production Technology): Efficient, economical, and recyclable 6. (Development and utilization of alternative energy): Use of waste heat, thermal efficiency, and adiabatic characteristic

Implementation Setup

■実施体制



Key:-)1. Country 1a. Subsidy 2. New Energy Development Organization (NEDO) 2a. Commission 3. Research Institute of Innovative Technology of the Earth (RITE) 4. Companies cooperating in research and development 5. Joint research 6. Send researchers 7. National Chemical Laboratory for Industry, Agency of Industrial Science and Technology, Ministry of International Trade and Industry (MITI)

R&D To Replace CFC-114

93WN0240B Tokyo CHIKYU KANKYO KAIGI
GLENTEX '92 SEMINA in Japanese 26 Nov 92 p 35

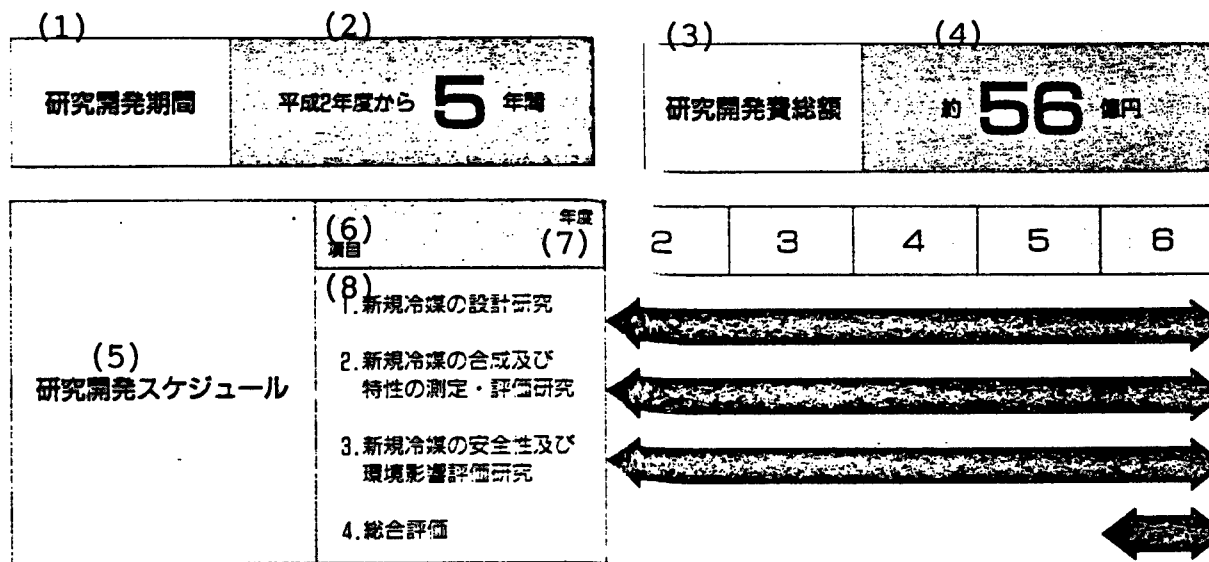
[Text]

Goals and Context of Research and Development

In order to develop and utilize industrial waste heat as an alternative source of energy replacing petroleum in the future, while, at the same time, taking into consideration such global environmental problems as destruction of the ozone layer and global warming, we are developing the following refrigerant for use in a compression heat pump system, designed to replace CFC 114 currently being used. The system is designed to produce high-grade heat of 100≈130 degrees from the most widely-available waste heat of 30≈60 degrees:

- (1) Its boiling point is ideal for use in waste heat of 30≈60°C;
- (2) Manifests high stability at temperatures 100≈150°C;
- (3) Characterized by high thermal efficiency, equal to or higher than that of CFC 114;
- (4) Contains lubricating oil with excellent compatibility (especially at high temperatures);
- (5) Will not burn easily;
- (6) Will not destroy the ozone layer;
- (7) Greenhouse effect is negligible;
- (8) Has a high degree of safety.

Since materials which possess the above characteristics do not exist in the CFC-substitute candidates currently in existence (the so-called "second generation CFC"), we are



Key:-)1. Duration of R&D 2. 5 years beginning 1990 3. Total R&D cost 4. Approximately ¥5.6 billion 5. R&D schedule 6. Category 7. Year 8. 1) Design research for new refrigerant; 2) Synthesis of new refrigerant and measurement and evaluation research into its characteristics; 3) Evaluative research regarding safety of the new refrigerant and its environmental impacts; 4) Overall evaluation

developing a refrigerant substance possessing a completely new molecular structure (the so-called "third generation CFC").

Implementations for 1990

- To gather already-existing data which we will require in constructing a database for use in the molecular design of a new refrigerant; and, based on the collected data, to study the correlation between its chemical structure and characteristics;
- After designing and installing test equipment to handle various types of fluorine, and, using this equipment, to begin synthesis tests. To install instruments for chemical structure analysis and to begin analysis of reaction products;
- To select for measurement the categories of the new refrigerant's basic properties, and to pursue research regarding methods of measuring these characteristics;
- To investigate the new refrigerant's basic properties related to safety and greenhouse effect factors and methods of measuring these basic properties.

Implementations for 1991

- To continue gathering existing data and to begin constructing a database;
- To commence research in a method of computing the new refrigerant's basic properties;
- To proceed with a synthesis test of the chemical compounds of new refrigerant candidates, and to modify the synthesis instrument, if required, in order to achieve established goals;
- To continue research regarding a method of measuring the new refrigerant's basic properties, to select measuring instruments, and to begin measuring;

- To investigate a preliminary test method for the new refrigerant's safety factor as well as methods of measuring its ability to decompose in the atmosphere and of computing its probable impact on the greenhouse effect.

Biodegradable Plastic

93WN0240C Tokyo CHIKYU KANKYO KAIGI
GLENTEX '92 SEMINA in Japanese 26 Nov 92 p 37

[Text]

Toward Development of Plastics Gentle to Environment
NEDO commissioned RITE to implement this project.

Eleven RITE researchers are conducting research jointly with Japan's foremost authorities in each of these fields at RITE's branch laboratories, established at AIST's Fermentation Research Institute and National Chemical Laboratory for Industry, in Tokyo Institute of Technology's Chemical Resources Research Laboratory, and at Kanagawa University. Dividing the research project roughly into three separate fields, this report provides an introduction to what is occurring in the forefront of each of the research fields.

[Synthesis of Microorganisms] Based on the concept that whatever is synthesized by microorganisms can be decomposed, also, by microorganisms, we are challenging the potential usefulness of microorganisms. The principal aim of this research is to manufacture still higher performance polymer materials at low cost by utilizing microorganisms. (Publication in academic circles: 2 papers)

- Screening : We are continuing our search for such useful organisms as blue algae, photosynthesizing organisms, anaerobic bacteria, and polymer degradation bacteria.

- **Microbial Engineering Field** : By controlling sources of nutrients given microorganisms, we are making them produce aliphatic polyester with a different structure through fermentation. We are searching for industrially useful polymers.

Genetic Engineering Field : Cloning of microbial biosynthetic genes characterized by high polymer productivity, as well as cloning of polymer degradation enzyme genes, is being implemented.

[Inducing Natural Materials] Researchers are conducting research and development of a technology designed to use natural raw materials, obtainable in large quantities at low cost, in producing plastics. This represents a plastic-based approach to recyclable-resource-use technology. (Publication in academic circles: 2 papers; patent application: 1)

- With respect to composite materials consisting of chemically-processed starch and synthetic polymers, we are accumulating data on the correlation between dispersion state and biodegradability as well as other

properties of these materials. By using biodegradable materials in synthetic polymers, we can obtain complete biodegradable plastics.

[Chemical Synthesis] Biodegradable plastic research still is a young field. We are yet to be able to gain an understanding in any depth even of biodegradation mechanisms of polymers. In order to develop a new material, a specific image of the desired molecular structure is essential as it provides us with answers to what we should be building. While constructing molecular design data, we are searching for a new polymer to be developed (Publication in academic circles: 2 papers; patent application: 1)

- **Polymer Degradation Bacteria** : In order to deepen our understanding of biodegradation mechanisms, researchers are conducting research on degradation bacteria;
- **Aliphatic Polyester** : they are developing direct synthesis reaction using carbon monoxide as a raw material.

Project Section's Branch Laboratory Setup

Branch Laboratory	Research Field	Cooperating Firm
Microbial Engineering Research Laboratory	microorganism synthesis	Sekisui Chemical Co., Toyo Boseki
	Use of natural materials	Chuo Chemical Co., Hino Chemical Co.
	Chemical synthesis	JSP
Chemical Tech. Research Laboratory	Chemical synthesis	Daicel Chemical Industries, Toppan Printing Co.
Tokyo Institute of Technology	Industrial production of Micro-organisms	Kanegafuchi Chemical Industry, Taisei Corporation, Hitachi Chemical Co.
Kanagawa University	Synthesis of micro-organisms	

Environmentally Harmonious Hydrogen Production

93WN0240D Tokyo CHIKYU KANKYO KAIGI
GLENTEX '92 SEMINA in Japanese 26 Nov 92 p 43

[Text]

"Aiming for Hydrogen Production Using Light and Micro-Organisms"

This is a research project which began in December 1991 involving joint efforts of six cooperating firms both here and abroad and of national research institutes. It will pursue the following research and development for the next eight years, ending in 1998.

(Research Objectives)

To develop an efficient hydrogen production technology utilizing microorganisms' hydrogen-producing capability so that, without wasting petroleum and other fossil energy resources, the production of the ultimate form of clean energy hydrogen, essential to the petroleum refinery process or effective use of CO₂, can be accomplished efficiently without adversely affecting a harmonious global environment.

(Summary of Research and Development)

(1) R&D on Methods of Searching for Photosynthesizing Microorganisms and of Achieving Improved Bacterial Strains Through Breeding

To undertake searching for and screening of microorganisms (photosynthesizing bacteria, blue algae, anaerobic bacteria, etc.) possessing excellent hydrogen-producing capability in the natural world as well as among those in a bacterial breeding reserve, while identifying and analyzing the functions of their hydrogen producing capability, and to improve it by using biotechnology's genetic breeding technique.

(2) R&D of Massive Cultivation Technique

In order to realize the maximum hydrogen production capability of photosynthesizing microorganisms, the project will develop cultivation and control technologies and incubation facility. Moreover, based on the results obtained, the project then will develop optimal techniques for massive-scale cultivation. Using a hydrogen-production bioreactor and photosynthesizing bacteria, anaerobic bacteria, and other single-group bacteria, as well as microorganism groups found in nature, the project will study the optimization of equipment, designed to create high concentrations of bacteria or to improve reaction speed, together with optimization of its operating conditions. Also, research and development of preliminary processing technique of substrate organic matter will be undertaken.

Bench-test equipment incorporating these technologies, will be manufactured and operated. The project, also, will study a control method designed to maintain optimum

(1) 光合成/非光合成の別	(2) 水素発生の酵素	(3) 微生物の種類	(4) 例	(5) 電子供与体
(6) 光合成を行うもの	(7) ニトロゲナーゼを用いるもの (8) ヒドロゲナーゼを用いるもの	(9) 光合成細菌 (10) 藍藻 (10a) 緑藻 (16) 窒素固定細菌 (17) 厳性嫌気性細菌 (18) 通性嫌気性細菌	(11) 非硫黄細菌 Rhodospirillum/Rhodobacter Chromatium/Thiocapsa (12) 硫黄細菌 Anabaena/Oscillatoria Chlamydomonas (18) 通性嫌気性細菌 Klebsiella/Clostridium (20) 偏性好気性細菌 Azotobacter Clostridium/Methanobacteria Escherichia	(21) 有機物(有機酸など) H ₂ S H ₂ S H ₂ S (22) 有機物(糖など) " " "
(13) 光合成を行わないもの	(7) ニトロゲナーゼを用いるもの (8) ヒドロゲナーゼを用いるもの	(16) 窒素固定細菌 (17) 厳性嫌気性細菌 (18) 通性嫌気性細菌		

(23) 水素発生を行う微生物の種類はこれまで多く、微生物の水素発生能力のあることが分かっている。発生のメカニズムは様々で、基質(電子供与体)、反応に関与する酵素なども異なる。

Key:-1. Distinction between photosynthesis and non-photosynthesis; 2. Hydrogen-producing enzyme; 3. Types of Microorganisms; 4. Example; 5. Electron donor; 6. Photosynthesizing; 7. Those using nitrogenase; 8. Those using hydrogenase; 9. photosynthesizing bacteria; 10. blue algae; 10a. green algae; 11. non-sulfur bacteria; 12. sulfur bacteria; 13. Non-synthesizing; 16. Nitrogen fixation bacteria; 17. Strict anaerobic bacteria; 18. Facultative anaerobic bacteria; 20. Strict aerobic bacteria; 21. Organic matter (e.g., organic acid); 22. Organic matter (e.g., sugar); 23. Classification of photosynthesizing microorganisms - It has been found that a large number of organisms have the ability to produce hydrogen. Its mechanisms are varied; also substrate (electron donor) and reaction-participating oxygen differ.

operating conditions, a method of combining microorganisms, a performance test using improved microorganisms, and investigation of properties of surplus bacteria.

(3) R&D of Hydrogen Separation Technology

The project will conduct R&D involving a technology designed to separate a produced hydrogen gas from other gases for refining. Also, a method of recovering hydrogen from an isolated membrane or a metal hydrogen compound will be studied.

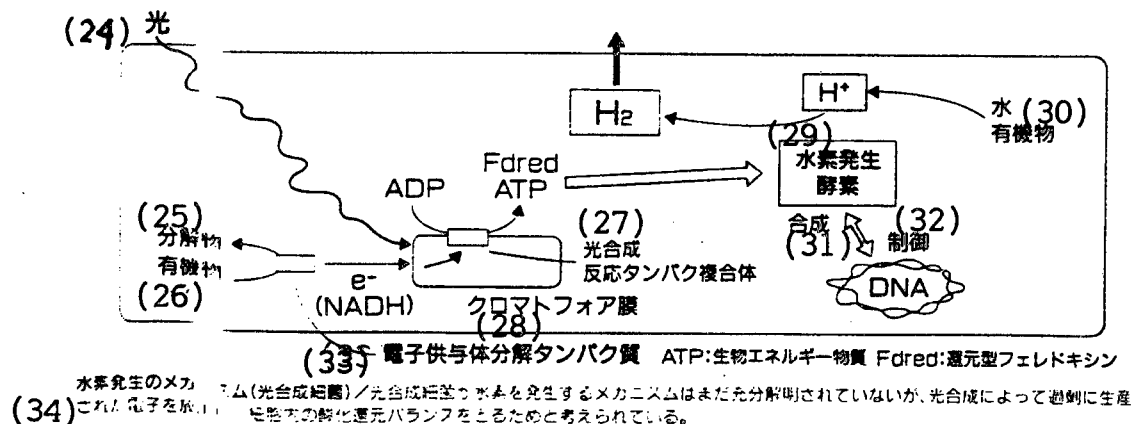
(4) R&D of Byproducts Recycling Technology

In order to obtain useful chemical substances as byproducts, the project will conduct R&D of a technology

designed to search for, produce, and extract useful byproducts. Specifically, it will study the effective use of excess bacteria which, themselves, were produced by a massive incubation reactor, as well as their effective use through addition of specific functions.

(5) Development of Integrated System

In order to conduct study of technology designed to develop efficient large-scale hydrogen production system and to develop an integrated operational technology based on results obtained from the projects described from (1) to (4), a plan for constructing a high-efficiency hydrogen production system will be drawn up; and, using a pilot-scale facility, the project will perform validation and evaluation.



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24. Light; 25. Decomposed substance; 26. organic substance; 27. Photosynthesis reactive protein complex; 28. [Chromato-4] membrane; 29. Hydrogen-producing enzyme; 30. Organic matter in water; 31. Synthesis; 32. Control; 33. Electron-donor decomposing protein; ATP : Bioenergy matter Fdred : reduced-form ferredoxin; 34. Hydrogen-producing Mechanism (photosynthesizing bacteria) - Although an adequate explanation of how photosynthesizing bacteria produce hydrogen has yet to be offered, one explanation of this mechanism is that the bacteria releases excess electrons produced in the course of photosynthesis to maintain its internal oxidation-reduction balance.

Cooperating Companies: Ishikawajima-Harima Industries, [Enricherque] S.P.A., Kajima Corporation, Kubota Corporation, Tokyo Gas Co., and Fuji Electric Research Institute.

Joint Research Organizations: Agency of Industrial Science and Technology. Fermentation Research Institute.

Based on the component technology research outlined in (1)≈(4) which will be completed by 1993, development of the system under discussion will start in 1994.

Biological CO² Fixation

93WN0240E Tokyo CHIKYU KANKYO KAIGI
GLENTEX '92 SEMINA in Japanese 26 Nov 92 p 44

[Text] This project, currently under development, is commissioned by NEDO.

The project deals with the CO₂ fixation and the development of a resource-recycling technology using photosynthesizing organisms and, as an energy source, solar light. Having succeeded in securing participation of more than 150 researchers from 16 cooperating firms, we have assigned five research themes to appropriate groups for implementation. The basic research was undertaken jointly with the University of Tokyo.

Let us now introduce the forefront of each research theme currently being pursued.

(Search for Photosynthesizing Microorganisms and Cultivation of Bacteria with Certain Strains)

Efforts will be made to search for and to collect extensively in the natural world photosynthesizing microorganisms which best meet objectives at hand; and, at the same time, to continue research on breeding of high-efficiency strains by pushing biotechnological capabilities to their limits.

1. Screening : To collect samples of photosynthesizing microorganisms from seas, lakes, and hot springs, based on the following search criteria: the organisms' resistance to high concentrations of CO₂, as well as to moisture and pH. We already are seeing the emergence of promising strains which can propagate under conditions of a high CO₂ concentration exceeding 20%, a high temperature of 55°C, and pH 23. (Publication in academic circles: 5 papers)

2. Molecular Breeding Field : Full-scale research in breeding of highly-efficient strains by utilizing biotechnology's cell fusion and genetic recombinatory techniques began in 1992.

[CO₂ Fixation Bioreactor]

We are working toward the development of a reactor system which maximizes the microorganisms' photosynthetic functions.

1. Reactor : The project is conducting tests aimed at grasping the structural and formal characteristics of various techniques, such as planktonic, liquid membrane, and fixation methods, in order to gather engineering data regarding the reactor equipment.

2. System Evaluation : The project is developing systems which presuppose a high-density cultivation of bacteria, including instrumentation used to measure microorganisms' activity by utilizing image analysis and online systems for measuring the organisms' salt consumption and metabolic activity.

(Condensation and Transmission of Solar Light)

Solar light is a source of energy essential to photosynthesis. For this reason, we are developing a technology designed to achieve efficient condensation of solar light and its transfer to a reactor.

1. Condensation Elements : We are prototyping various types of condensation components, using lenses and mirrors in order to make a comparative evaluation of each of the optical element and to work toward improved efficiency.

2. Transmission Elements : We are studying the characteristics and handling of optic fibers used in transmission, such as core diameters and clad materials.

(Useful Materials)

It is important that we recover and utilize useful products of photosynthesis, such as energy conversion and bioactive substances, and, at the same time, that we bear in mind their uses as biomass resources.

1. Energy Conversion Substance : We are implementing the methods of recovery and of the impurity removal of hydrocarbon produced by botryococcus as well as structural analysis of extracted oil.

2. Separation and Refining : Using bio-resources, we are gathering basic data on the separation and refining of useful substances.

(Total System)

Ultimately, this will be a project which will integrate these separate systems into a total system. Our task then will be to work toward the optimization of subsystems attached to each system, thereby improving the efficiency of the total system.

I. Cooperating Firms : Hitachi. Ltd., Ishikawajima-Harima Industries, Sumitomo Heavy Industries, Mitsui Engineering and Shipbuilding Co., Toyo Engineering, Mitsubishi Heavy Industries, Kawasaki Heavy Industries, Taisei Corporation, Hitachi Zosen Corporation, Asahi Glass Co., Marine Biotechnology Research Institute, Ltd., Idemitsu Kosan Co., Okinawa Petroleum Refining, Ltd., Nippon Petroleum Refining Co., Sumitomo Chemical Co., Mitsubishi Petrochemical Co., and Association of Regional Industrial Promotion.

II. Joint Research Organization : Center for Research in Advanced Science and Technology, University of Tokyo.

Russian Nuclear Waste Ocean Dumping Stopped

OW0404132293 Tokyo KYODO in English 1234 GMT
4 Apr 93

[Text] Niigata, April 4 KYODO—Russia will never again dump nuclear waste in the ocean, a spokesman for the Russian presidential office said Sunday.

Valeriy Butev, a presidential spokesman on policy on coastal regions, made the comment at a press conference in Niigata when asked about reports the former Soviet Union disposed of nuclear waste in the Japan Sea.

Butev, who is in Niigata to attend ceremonies commemorating [passage indistinct].

Fisheries Agency To Ban Catch of Two Types of Dolphins*OW0504141793 Tokyo KYODO in English 1344 GMT 5 Apr 93*

[Text] Tokyo, April 5 KYODO—The fisheries agency decided Monday [5 April] to ban fishermen from catching two types of dolphins, Pacific white-sided dolphins and common dolphins, agency officials said.

The officials said the agency reached the decision as the resource condition of the two types of dolphins is not known.

In addition, an appreciable cut has been set for 1993 in the number of striped dolphins which the agency permits fishermen to catch in Japanese coastal waters, according to the officials.

The agency set a ceiling on other types of dolphins as well.

The decisions were considered a reply to the recommendation adopted last year by the scientific committee of the International Whaling Commission (IWC) that the catch of striped dolphins be banned.

Since 1991, the agency has set a self-imposed ceiling on dolphin catches in Japanese coastal waters due to mounting international criticism against the nation's policy of allowing the [passage indistinct].

Ceiling on Striped Dolphin Catches 'Sharply Cut'*OW0704135093 Tokyo KYODO in English 1311 GMT 7 Apr 93*

[Text] Tokyo April 7 (KYODO)—The Fisheries Agency has sharply cut its self-imposed ceiling on this year's catch of striped dolphins in response to mounting calls for a ban on catches of the endangered species, agency sources said Wednesday [7 April]. The agency also virtually banned fishermen from catching Pacific white-sided dolphins and common dolphins, whose population conditions are not known. The changes have been notified to eight concerned prefectures, including Hokkaido, Aomori, Shizuoka and Okinawa.

Since 1991, the agency has set a self-imposed ceiling on dolphin catches in Japanese coastal waters due to growing international criticism against the nation's policy of allowing dolphin catching. The International Whaling Commission (IWC) adopted a proposal last year that dolphin catches be under strict control and supervision by watchdogs.

According to the ministry's notice, catches of striped dolphins have been cut to 725 this year from about 1,000 caught last year, while total catches of other types of dolphin have been reduced by up to 100 to about 21,000. Japanese fishermen caught dozens of Pacific white-sided dolphins and about 280 common dolphins last year.

Miyazawa To Propose Joint U.S. Environmental Plan for Eastern Europe*OW0704132693 Tokyo KYODO in English 1300 GMT 7 Apr 93*

[Text] Tokyo, April 7 (KYODO)—Prime Minister Kiichi Miyazawa will propose that Japan and the United States

launch a joint program to help improve the damaged environment in Eastern Europe, government sources said Wednesday.

Miyazawa will make the proposal when he meets U.S. President Bill Clinton in Washington on April 16, the sources said.

The Japanese proposal will call for providing funds, personnel and knowhow needed to help Eastern Europe repair damage to forests caused by acid rain and look at ways to clean up water polluted by industrial and household waste.

Miyazawa will tell Clinton that Japan is ready to provide 1 billion dollars in Official Development Assistance (ODA) and Export-Import Bank of Japan loans for the project, they said.

The program is aimed at Poland, Hungary and the Czech Republic, and Japan is considering extending the area to be covered to the three Baltic republics of Lithuania, Latvia and Estonia, the sources said.

It would be the first time for Japan and the United States to join hands in promoting global environmental preservation, the sources said.

The Japanese proposal first calls for setting up a panel of environmental experts from both countries and then drawing up firm projects after inspecting threatened areas.

SOUTH KOREA**Meeting To Investigate Russian Nuclear Waste Dumping***SK0304083293 Seoul YONHAP in English 0752 GMT 3 Apr 93*

[Text] Seoul, April 3 (YONHAP)—An inter-ministerial meeting opens next week to investigate the damages from confirmed nuclear waste dumping in the East Sea by Russia, officials said Saturday.

The meeting among Foreign, Defense, Science and Technology and Fisheries Ministries will plan mobilization of vessels, experts and expenses for the investigation either by South Korea alone or with Japan and Russia, officials said.

One official said Seoul, Tokyo and Moscow have agreed in principle to jointly look into the environmental damage from the nuclear waste dumping and will ask global organizations like the International Atomic Energy Agency (IAEA) for added assistance.

Russia is expected to hand over a copy of its white paper on environment to South Korea next week and investigation will start immediately after that, officials said.

Plans To Call for Pollution Survey at Regional Conference*SK0604072793 Seoul YONHAP in English 0641 GMT 6 Apr 93*

[Text] Seoul, April 6 (YONHAP)—South Korea will call for the formation of international pollution survey teams at the second Northeast Asian pollution conference, slated for October in China, the Environment Ministry said Tuesday.

Under an agreement on regional cooperation in pollution surveys and anti-pollution programs reached at the first five-nation meeting, held in Seoul in February, the ministry is working on a plan to form regional survey teams for air pollution, acid soil and endangered wildlife for the October conference.

Korea, China, Japan, Mongolia and Russia are the five nations.

In anti-pollution programs, the ministry is reviewing a joint Korea-China project to develop a pollution-free method of burning fossil fuels, which the two countries greatly depend on for energy.

Korea will also submit plans to preserve endangered species in the region and build an ecosystem data bank at the conference, ministry officials said.

In addition, exchange of information on international movements of harmful substances and the establishment of regional environmental standards will be proposed at the meeting.

Environmental Violations Inspections 'Ineffective'

SK0604041193 Seoul THE KOREA TIMES in English
6 Apr 93 p 3

[Text] Crackdown on environmental violations by industrial companies have become increasingly ineffective after the transfer of inspection responsibilities to city and provincial administrations.

According to the Environment Ministry yesterday, the lack of trained manpower in the field is a major factor contributing to the difficulty of conducting proper inspections.

One outstanding example of how ineffective the inspections have been is the sharp reduction in the number of companies found to be committing environmental violations.

"We would like to believe that this is the result of industrial companies refraining from engaging in various illegal activities but inspections by provincial environmental administrations prove otherwise," one official observed.

The fundamentals, nevertheless, are there. Since the responsibilities were transferred to the city and provincial administration last June, the number of inspectors were expanded from 1,430 to 2,882.

At the same time, the officials said, the number of pollution measuring and other environmental data-taking devices increased from just 181 to 594 over the past 10 months.

Based on the numerical increments, the manpower and proper equipment is not the problem. The difficulty, the officials said, lies in the fact that most of the inspectors are ill-qualified for the job.

Among the 2,882 inspectors, only 37 percent have been trained in pertinent fields of inspecting environmental pollution and over 70 percent have less than two years of experience.

Owing to the lack of expertise, the inspectors are relying solely on statistical data, which can sometimes be deceiving or can be fabricated, to determine the extent of pollution.

One ministry official noted, "The role of inspectors is not only to crack down on those violating environmental regulations but to provide industrial companies with guidelines and advice to conform to the rules."

Since the dependence on equipment readings and the inability to identify areas of potential problems means that long periods of time are required, the increased number of inspectors have been able to conduct comparatively fewer tests.

As a result, the number of cases in which companies were fined or otherwise reprimanded fell by 24.8 percent and the amount of fine decreased by as much as 40 percent since the transfer of inspection responsibilities.

The officials said the ministry is hoping to dispatch qualified personnel to provincial administrations to train them in effective inspection methods but it could be a while before proper measures are administered across the country.

TAIWAN

Questions on Extent of Nuclear Plant Safety Zone

OW1104070193 Taipei China Broadcasting
Corporation News Network in Mandarin 2300 GMT
1 Apr 93

[Report by Chung Ya-fen; from the "Hookup" program]

[Text] In light of questioning by legislators on the fact that the safety zone around our country's nuclear power plant fails to meet the U.S. standard, the Atomic Energy Commission of the Executive Yuan emphatically pointed out that according to the dual-protection design [ho tzu shuang chung wei tsu ti] of the nuclear power plant, the safety zone can be reduced. It is still not known whether or not the U.S. Nuclear Energy Control Commission will revise its existing regulations.

In order to meet the design standards of nuclear reactors, the U.S. Nuclear Energy Control Commission put forward a proposal to revise the safety zone for nuclear power plants in October last year. It hoped to make the safety zone for nuclear plants 640 meters.

Following the revelation of the U.S. draft plan, legislators have strongly opposed the domestic plan, claiming the Atomic Energy Commission did not attach importance to the safety of nuclear power plants in our country.

In the light of questioning by legislators, the Atomic Energy Commission of the Executive Yuan said that according to existing regulations governing nuclear power plants in the United States and our own country, the safety zone may vary in accordance with the design of the nuclear reactor. The scope of the safety construction zones of the No. 1, No. 2, and No. 3 nuclear power plants, therefore, are 800 meters, 600 meters and 1,000 meters respectively. The reduction in the safety construction zone of the planned

No. 4 nuclear power plant to 350 meters is based on its design and is definitely in compliance with safety requirements.

(Huang Ching-tung), head of the Nuclear Control Division, said: [begin recording] Our planned No. 4 nuclear power plant will use dual-protection design [shuang chung wei tsu ti] in the future. According to the results of calculations, its safety construction zone can be reduced to 350 meters. It is totally in compliance with the existing regulations governing the sites of nuclear power plants. [end recording]

(Huang Ching-tung) also particularly stressed that the U.S. Nuclear Energy Control Commission's decision on revising the standards for construction sites cannot be finalized in the short term. Those countries which have nuclear power plants with dual-protection designs, such as Belgium and France, also do not have a so-called no construction zone. They all use the plant site as the boundary.

VIETNAM

Prime Minister Issues Instructions For Protecting Rare Wildlife

BK0704074993 Hanoi VNA in English 0612 GMT 7 Apr 93

[Text] Hanoi VNA April 7—Prime Minister Vo Van Kiet on March 27 issued an instruction on the management and protection of rare animals and plants.

The instruction pointed out that though the state had issued many legal documents on this issue, so far the hunting of rare animals and exploitation of rare plants

have not been put under control. Many species have been exterminated or are facing the danger of extinction in the not distant future.

The instruction ordered the following main measures to be taken without delay:

- Not to allow hotels and shops to display or sell rare birds or stuffed animals peculiar to the locality.
- To impose a strict ban on the illegal sale of rare animals of animals peculiar to the locality local and border market for the purpose of raising as pets, for making medicines or for slaughter as food.
- In order to preserve the ecological balance, to restrict to the minimum level the catch for export of animals to be used as food such as snakes tortoises, crabs, frogs and other animals and plants which though not rare or precious are threatened with exhaustion.
- To publish soon 'Vietnam's Red Book' and make active preparations for Vietnam to join the International Convention against Cross-Border Trading of Rare Animals.

Hydrometeorological Station To Be Set Up in South

BK0804071793 Hanoi Voice of Vietnam Network in Vietnamese 0500 GMT 7 Apr 93

[Text] The prime minister on 31 March enforced decision no. 133-TCG on the setting up a hydrometeorological station in the southern part of the country.

The southern hydrometeorological station is duty-bound to perform the tasks assigned and to exercise the powers delegated to it by the head of the General Hydrometeorological Department, in managing and organizing preliminary surveys in support of hydrometeorological work, as well as in controlling water and air environment in the southern provinces.

BULGARIA

'Proof' Offered of Air Pollution From Romania

AU0304202193 Sofia BTA in English 1831 GMT
3 Apr 93

[Text] Silistra, April 3 (BTA)—There is indisputable scientific proof that air pollution in this Danubian city originates in the metallurgical works in the Romanian town of Calarasi. The results of parallel analyses by the National Centre for Hygiene, Medical Ecology, and Nutrition and the Electronics Institute with the Bulgarian Academy of Sciences were presented at a meeting of the Silistra Municipal Council.

This is actually the first stage of a broader study of pollution in Silistra and its health effects, carried out by the National Centre for Hygiene under Prof. Bozhidar Nikiforov. Studies by the Electronics Institute give even more conclusive proof of transboundary pollution. Sulphur and nitrogen dioxide come from local polluters, says the National Centre for Hygiene. Hydrogen sulphide, phenol and metal aerosols come from the metallurgical works in Calarasi, Romania, experts say. The maximum hydrogen sulphide content of the air in 1991 exceeded Bulgarian standards between 6.6 and 10.3 times at the two monitoring posts. In November and December 1991 phenol exceeded them between 1.5 and 4 times, and up to 8 times between 1 and 3 AM.

As a result, the incidence of respiratory diseases in the urban population is 5 percent higher than the country average. Acute respiratory diseases have increased 120 percent.

EC Center Starts Energy-Saving Program

AU0604150093 Sofia BTA in English 1008 GMT
6 Apr 93

[Text] Sofia, April 6 (BTA)—The European Community's energy centre, opened in Sofia in July 1992, started implementing its programme which seeks to cut power consumption in Bulgarian industry.

The operation of the centre, which is part of the OPET network (Organizations for Promotion of Energy Technologies), is directed by the Directorate General for Energy (DG XII) through the Thermie Programme.

One initiative of Sofia's energy centre is to monitor power consumption in Bulgaria's food processing industry. This problem, with special emphasis on the systems for steam production and distribution, will be considered at the third in a series of experts' meetings organized by the centre. There are also plans to hold a roundtable discussion on the opportunities for joint projects and cooperation between Bulgarian companies and companies in the EC countries.

The specific power consumption in Bulgarian buildings is too high by Western standards, centre experts found. In their view, there are considerable opportunities for energy saving in the heating of premises. In this connection, experts of the centre are analyzing the Bulgarian building materials market.

Experts of the centre are exploring opportunities to apply European technologies for the efficient and environment-friendly use of fuel. They will study the chances for the future introduction of European wind power technologies in Bulgaria, as well as opportunities to use waste biomass as an energy source.

CZECH REPUBLIC

Environmentalists Want To Maintain Federal Umbrella

AU0604131693 Prague CTK in English 1509 GMT
4 Apr 93

[Text] Prague April 4 (CTK)—The thirty-eight Czech and Slovak environmental organizations grouped under the name Green Circle held an open meeting this weekend at which they vowed to continue coordinate activities in both republics, in the aftermath of Czechoslovakia's division on January 1.

The gathering took place Saturday and Sunday [3 and 4 April] at Helfstyn Castle in North Moravia.

Green Circle members voted to remove the designation Czechoslovak from their title, though the five organizations present from Slovakia expressed the wish to continue working jointly with their Czech colleagues, said Josef Vavrousek, former chairman of the Federal Committee for the Environment and a member of the organization's Governing Council.

He said environmental organizations should not only focus on individual actions to protect nature or block specific ecologically-harmful projects, but should also propose constructive environmentally-friendly alternatives.

Green Circle elected a new ten-member Council and Auditing Commission, which includes Vavrousek and former Czech Republic Minister for the Environment Ivan Dejmal.

Fire at Central Bohemia Chemical Plant, No Carcinogenic Products Generated

AU0804133993 Prague CTK in English 1023 GMT
5 Apr 93

[Text] Prague April 5 (CTK)—Twelve people were injured in a fire which broke out in the Spolana chemical plant at Neratovice, Central Bohemia, this morning and which was accompanied by an explosion.

Director General Zdenek Votava told CTK by phone that the severity of the injuries has not yet been ascertained. Some workers have suffered burns, others were cut.

The fire, which erupted at 7:21 this morning, has already been extinguished, Votava said. He added that the fire broke out in the PVC Polymerization division which had been out of operation since Saturday [3 April] due to an overhaul.

PVC Polymerization is one of Spolana's seven divisions.

Six people have been taken to hospital at Melnik near Neratovice, three of whom have been released after treatment, CTK learnt.

Two of the six have suffered severe injuries, one a medium injury and three are light injuries, a doctor from the surgical department told CTK.

The injuries include brain concussion, fractures, cuts and contusions, the doctor added.

The substance which exploded and burned in Spolana Neratovice today was the toxic carcinogenic vinylchloride monomer (VCM), but no carcinogenic products have been generated in the fire, head of the investigating commission Martin Dobes told CTK.

The air pollution has not exceeded the permissible levels, a Civil Defense (CO) officer said. Therefore, CO units alert could be called off, he added.

Only one of those injured in the Spolana chemical plant explosion this morning was placed on the critical list at the Vinohrady hospital's Burn Unit in Prague where four more seriously injured persons were transferred by air from the site some 40 kilometers (25 miles) north of Prague.

Chief of the Burn Unit Dr Radana Konigova said the man on the critical list was also treated for serious burn damage to his respiratory system besides numerous injuries.

The others at the Burn Unit were listed in satisfactory condition, but under a close watch as is the usual procedure with burn victims, Dr Konigova said.

Plant officials later raised the number of victims to 14 and reassured the public that the explosion did not result in a long-term contamination.

[Prague CESTKY DENIK in Czech on 6 April on page 13 carries a 700-word Pavel Kubiela report on the above accident, which notes that "according to unconfirmed information, it is theoretically possible that phosgene was released in the burning process, an inflammable substance that was used as chemical warfare gas during the war."]

Majority Favors Increased Use of Nuclear Energy

AU0804130693 Prague CTK in English 1217 GMT
6 Apr 93

[Text] Prague April 6 (CTK)—Czech citizens believe that production of energy from hydroelectric and non-traditional sources such as solar and wind power should be increased or maintained at their present level in the next ten years, while oil and coal energy production should be limited or abolished.

These findings are the result of an opinion poll, conducted in the first half of March 1993 by the Institute for Public Opinion Research, of 722 citizens of the Czech Republic over the age of 15.

Respondents rated whether production from individual sources of energy should be increased, maintained at their present level, limited or abolished in the next ten years.

A full 90 percent of those polled said that production of hydroelectric energy should increase or be maintained at the present level, while 85 percent said the same about non-traditional sources, 65 percent about gas electricity, and 63 percent about nuclear energy.

The use of coal as an energy source should be limited or abolished, said 79 percent of the respondents, while 36 percent said the same about oil.

Citizens who see positive reasons—such as improving the environment in North Bohemia and securing a sufficient energy supply—for the Czech Government's decision to complete construction of the Temelin nuclear power plant in South Bohemia were more likely to say that production of nuclear energy should increase. Those who believe the government's decision was based primarily on Czech and foreign economic and political interests were less likely to favor increased nuclear energy production, the poll found.

[Prague LIDOVE NOVINY in Czech on 7 April on page 3 carries a 200-word CTK report on the results of the above poll, which specifies that "63 percent of respondents said that electricity generation in nuclear power stations should be increased or maintained at the present level while 23 percent were in favor of limiting or abolishing it."]

SLOVAKIA

Company Director Cites Positive Aspects of Gabčíkovo

AU2603144993 Prague CTK in English 1832 GMT
24 Mar 93

[Text] Bratislava March 24 (CTK)—Slovakia needs some eight billion Slovak crowns (approximately 260 million USD) to build its water management network, Julius Binder, director of the Vodohospodarske Stavby water management firm, told journalists today.

Binder, whose firm is responsible for the completion of the controversial Gabčíkovo hydroelectric plant on the Danube, said in case foreign monetary institutions are ready to finance the construction of Slovakia's water management network profits from Gabčíkovo could be invested in other areas, for example in social security.

Binder, who visited the United States and Canada recently, said many foreign firms and banks took interest in the Gabčíkovo hydroelectric project. He voiced the view that Slovakia should expand information on Gabčíkovo so that foreign expert circles are able to assess the importance of the project.

Asked how the damming of the Danube River in the autumn of 1992 has affected the surrounding environment, Binder said the underground water level has risen and the situation will further improve once the plant is put into full operation.

[Bratislava HOSPODARSKE NOVINY in Slovak on 25 March on pages 1 and 2 carries a 900-word Vladimir Duduc report on the above news conference. According to the report, Julius Binder said that "the results of the five months of operation of the Gabčíkovo hydroelectric power project are very favorable. The quality and the level of underground water are improving and the horrifying predictions of an ecological catastrophe have not been confirmed. Quite the contrary, they have been refuted." Binder is reported to have said that, after the damming of the Danube near Cunovo, reservoirs of underground water

have "substantially increased," including "on the Hungarian side." The "best indicator" of the improving quality of water in the area, according to Binder, is that "birds have begun to nest" along the channel leading to Gabcikovo. Binder also claimed that the Lesser Danube, a Danube branch that "had for more than 20 years been a sewer for Bratislava sewage and waste from the Slovnaft refinery" has again become a "stream that is teeming with life."]

**Environmental Congress, Elects Chairman,
Discusses Organizational Changes**

AU0704095293 Bratislava PRAVDA in Slovak
5 Apr 93 p 2

["er"-signed report: "Environmentalists With a New Chairman"]

[Text] Spisska Nova Ves—The eighth congress of the Slovak Union of Nature and Landscape Protectors (SZOPK) ended yesterday after two days of deliberations. More than 100 delegates from all districts of the republic discussed the further direction of the activities of this organization, which has 6,500 members. The discussion speeches showed that the organization is undergoing a process of transformation under new and harsher economic conditions. The SZOPK's professional apparatus has been reduced to a minimum. The SZOPK wants to move from campaigns and activities marked by vehemence toward activities that exert pressure on the adoption of ecological legislation. The SZOPK leadership, too, underwent major changes. A seven-member SZOPK Executive Committee was elected by secret ballot, which then elected Miroslav Fulin, researcher at the East Slovak Museum, as its chairman. Fulin thus replaced Mikulas Huba as SZOPK chairman.

POLAND

No Rise in Radiation Level Reported

LD0704173993 Warsaw PAP in English 1640 GMT
7 Apr 93

[Text] Warsaw, April 7—There has been no rise in radiation levels in Poland in recent days, despite the breakdown reported by Russia in one of its chemical plants, deputy head of the State Atomistics Agency Witold Lada declared Wednesday.

Nevertheless, the agency instructed the Radiological Protection Service to take more frequent measurements of radiation levels.

ROMANIA

**Vacaroiu, FRG Minister View Environmental
Protection, Penalties**

AU0604092593 Bucharest ROMPRES in English
1759 GMT 5 Apr 93

[Text] Bucharest ROMPRES, 5/4/1993—The Romanian-German relations in general and cooperation in environment protection in particular were the main topics discussed during the dialogue between Romanian Premier

Nicolae Vacaroiu and German Federal Environment Minister Klaus Toepfer at the Romanian Government headquarters Monday, April 5.

The Romanian premier reviewed the bilateral relations, pointing out their ascending evolution, also confirmed by the foreign investors' growing interest.

About the situation of the toxic wastes in the Romanian county of Sibiu, the guest renewed assurances they would leave the Romanian territory within the shortest delays.

Both sides expressed their desire to cooperate in getting exemplary penalties for those responsible for bringing the toxic wastes to Romania.

**Ilie, FRG's Toepfer Sign Environmental
Protection Agreement**

AU0604131293 Bucharest ROMPRES in English
0812 GMT 6 Apr 93

[Text] Bucharest (ROMPRES) 6/4/1993—An agreement on collaboration in environmental protection was signed in Bucharest, on April 5 evening, between the Governments of Romania and the Federal Republic of Germany. The two parties were represented by Aurel Constantin Ilie, minister of water, forestry and environment, and Klaus Toepfer, federal minister of environment of Germany.

The agreement stipulates collaboration between the two countries in the measurement of polluting substance emanations and their reduction in the air, protection of surface and underground water quality, the administration of wastes and the elimination on long term of the effects of old residues, the protection of nature and territorial development, ecological education, specialty cadres' training, general and organizational issues of the environment policy, environment law and economic aspects of that policy.

The agreement is in force for 5 years and renews itself for further five-year periods.

After the signing of the agreement, the German minister of the environment told the press he was "sure the relations between Romania and Germany will not be confined to eliminating scandals that persisted these last few months, allowing instead for a systematic cooperation as far as the environment is concerned". "We hope to find the legal framework as regards cooperation in environment protection, so that we may achieve specific projects in water administration, air cleaning and waste elimination, as well as in environment-conscious education", the German minister added.

The Romanian minister of water, forestry and environment assessed in turn that "the agreement lays foundations to a more detailed program of collaboration between the two ministries".

**FRG's Toepfer Apologizes for Toxic Waste Sent
to Sibiu**

AU0604131093 Bucharest ROMPRES in English
0749 GMT 6 Apr 93

[Text] Bucharest (ROMPRES) 6/4/1993—The German minister for the environment, Nature Protection, and

Security of Reactors, Klaus Toepfer, who arrived on Sunday, 4 April, in Sibiu, publicly presented his apologies during a press conference to the inhabitants of that area where toxic wastes coming from Germany had been stored, and also to the Romanian Government.

At the meeting with the German and the Romanian press held at the Sibiu hotel it was made clear that the aim of the

visit paid to Sibiu by the German minister of the environment is to make an on-the-spot information on actions of returning toxic wastes stored in that area.

The direct intervention of the minister of the environment had been necessary after all attempts to find a solution to operations of sending back toxic wastes together with the federal lands involved in the affair were doomed to failure.

ARGENTINA

Proposed Radioactive Dump in Salinas Grandes Challenged

PY0504155093 Buenos Aires NOTICIAS
ARGENTINAS in Spanish 0133 GMT 4 Apr 93

[Text] Buenos Aires, 3 Apr (NA)—Justicialist Party Senator Alicia Saadi has asked the National Commission for Atomic Energy (CNEA) to confirm if it has considered installing a radioactive waste dump in the Argentine salt flats basin which will reportedly affect Catamarca, La Rioja, Cordoba, and Santiago del Estero.

In her request to the Senate, the senator for Catamarca asked the CNEA to also report if it researched the "possibility of clandestine radioactive waste contamination or naturally occurring contamination in the zone of Antofagasta de la Sierra."

The senator bases her request on a report by the National Foundation in Defense of the Environment which states that the CNEA is reportedly considering the construction of a radioactive waste dump in the region of Salinas Grandes.

This region encompasses northern Cordoba, the southern part of Santiago del Estero and Catamarca, and the southwestern part of La Rioja.

HONDURAS

Raw Sewage Contaminates Reservoir

93WN0338A Tegucigalpa EL HERALDO in Spanish
12 Mar 93 p 2

[Text] Yesterday, the manager of the National Waterworks and Sewer Systems Service (SANAA), Julio Carcamo, confirmed the fact that the water in the Los Laureles reservoir is contaminated with human excreta. However, he explained, before the liquid is sent for the population's consumption it is subjected to a purification process.

The official claimed that the water, which reaches households in the capital through piping, is completely clean, because there is a treatment plant at the reservoir itself, taking constant samples to determine the water quality and removing impurities.

Carcamo explained that the pollution is due to the lack of sewage collectors for nearly 18,000 persons living on the shores of the river supplying the reservoir. This concurs with the report submitted by the National Congress Investigating Commission.

Nevertheless, he admitted that, if the contamination continues on its present scale, within about three to five years the Los Laureles water supply will have to be stopped, because the excreta will have exceeded the tolerance limit for its treatment.

The SANAA manager also noted that the contamination is being produced by approximately 14 military units operating in the vicinity of the reservoir and its tributaries. None of them have systems for eliminating excreta.

He explained that, seven years ago, a plan was devised including the construction of a sewage collector for each

community and each military unit, which would operate independently, solely to prevent the flow of excreta into the river waters.

However, the project was not implemented, and now the merger idea has been advanced, to build a single subcollector that would receive sewage from the entire adjoining community and also from the future inhabitants of the "Ciudad Mateo" housing project.

Currently, the number of residents in the area is approximately 18,000; but, with the construction of the "Ciudad Mateo" housing project, that number will double, and the contamination would be lethal without a common collector.

Although the contamination level at the reservoir is high, the population should not be concerned (Carcamo claimed), because the water reaching the household faucets has previously undergone extensive cleaning treatment.

The Los Laureles reservoir distributes water to a large portion of Comayagua, which would be hurt if the water supply were stopped, because it is the only source of supply for thousands of residents.

Last week, the La Concepcion reservoir began assisting Los Laureles, sending it approximately 400 liters of water per second, for subsequent distribution to the population.

The advantage of the water from La Concepcion is that it arrives at Los Laureles clean, having been processed at the treatment plant with the rest of the liquid from the new project being supplied to the rest of the population, especially in Tegucigalpa.

PARAGUAY

Foreign Minister Requests Argentina Close Canal on Pilcomayo River

PY0504185993 Asuncion ABC COLOR in Spanish
5 Apr 93 p 20

[Excerpts] Foreign Minister Alexis Frutos Vaesken yesterday said that Paraguay has no other alternative than to ask Argentina to close the canal it opened on the Pilcomayo River. "This is our only alternative; we must request the closure of the canal," he stated.

He said that any negotiations on the subject must include the closure of the canal. "We want to reinstate the normal water course. After that, we will begin to negotiate," he said.

Frutos Vaesken said that the river diversion must be corrected because it violates international laws and principles. "They are using water without permission when that was not what we sought. That is not what we wanted," he said.

He said that an agreement with the Argentine Government must be ready before the works begin in the zone affected by the diversion of the river water. He said that work will begin after the water level drops, "by the end of May or mid June."

The foreign minister said that he will discuss this subject with his Argentine counterpart during a meeting in Santa Cruz de la Sierra.

When asked whether he will ask Argentina for a written commitment on the problem, he said: "Of course," adding that there already exists a promise by the Menem administration to discuss the subject. [passage omitted]

The minister said that the cooperation of the Armed Forces is essential because they will open roads and clear the area. "We cannot get the machinery to the site because there are no roads. That is why we need the help of the Army," he said.

Frutos Vaesken admitted that he is aware of the seriousness of the problem and stressed that negotiations must be complete before the water level begins to drop.

At the end of the news conference, and after the microphone was turned off, the minister said that if the problem is not solved fast, Paraguay should excavate other canals to recover the water.

Armed Forces 'Ready To Act' On Pilcomayo River Canal Diversion

*PY0504190293 Asuncion ABC COLOR in Spanish
5 Apr 93 p 20*

[Text] Army Commander Division General Pedro Concepcion de la Cruz Ocampos has labelled the building by Argentina of a canal to divert the normal course of the Pilcomayo River as "usurpation." He said that the Armed Forces are ready to guarantee the sovereignty of Paraguayan territory. "The Armed Forces are ready to act if necessary," he said.

Ocampos was member of the delegation that was supposed to have overflowed the river course but which was postponed because of bad weather in the town of Pedro. P. Pena. The plane was forced to return to the capital without accomplishing its objective.

He labeled as positive the fact that representatives of the Paraguayan forces "went to see where the river is being diverted, to witness this usurpation by our neighbor."

He said: "It is clear that beside the technical work done to deviate the river course, there is an evil attitude by Argentines against our sovereignty."

When asked about the measures that the Armed Forces could adopt to solve the problem, Ocampos said: "The Armed Forces, in their role to safeguard our sovereignty and our border, are ready to guarantee our territory."

He said that this "is a very singular case, where the Armed Forces and other institutions are acting responsibly to guarantee our possessions."

"The Armed Forces are ready to act if necessary," he added.

When asked what he meant concretely, he said: "To establish our presence, to cooperate with different groups in clearing the vegetation and facilitating the work that must be done."

Finally, Ocampos said that the problem of the Pilcomayo River is of national interest.

Argentina Agrees To Close Channel That Diverts Pilcomayo River

*PY0704145693 Asuncion ABC COLOR in Spanish
7 Apr 93 p 15*

[Text] Foreign Minister Alexis Frutos Vaesken has confirmed that President Andres Rodriguez and Argentine President Carlos Menem will meet on 13 April at the Yacyreta hydroelectric dam site. The venue of the meeting was decided on 6 April when it was learned that the Argentine Government had officially promised to close the channel that is diverting the Pilcomayo River. Rodriguez and Menem are expected to sign a joint declaration.

Frutos Vaesken returned on 6 April from Santa Cruz de la Sierra, where he participated in a regular meetings of foreign ministers of the Rio Group. While there, the foreign minister took the opportunity to discuss with [Argentine Foreign Minister Guido] Di Tella the diversion of the Pilcomayo River. Frutos Vaesken said he received assurance from the Argentine Government that Paraguayan demands will be met as quickly as possible and that the channel opened on the right bank of the river will be closed. [passage omitted]

Enrique Iglesias, the president of the Inter-American Development Bank may visit the Yacyreta dam site while the two presidents are there.

REGIONAL AFFAIRS

SAARC To Form Environmental Committee

BK0604160893 Dhaka Radio Bangladesh Network in English 1530 GMT 6 Apr 93

[Text] The main concern of the ensuing SAARC [South Asian Association for Regional Cooperation] summit in Dhaka will be the revival of confidence among the member-countries. This was stated by Foreign Secretary Reaz Rahman while briefing newsmen in Dhaka today. He said the main thrust of the summit would be to improve the standards of living of the common man of the member-countries.

He said the SAARC leaders will try to streamline the activities of the forum. The foreign secretary said an independent commission on poverty alleviation will be formed. Besides, two other major technical committees will be formed in different fields. One more committee on environment will also be formed. He said that an independent regional South Asian preferential trade arrangement will be made to protect the interests of the region. Mr. Reaz Rahman said the SAARC leaders will discuss the cooperation with other regional bodies, like ASEAN and EC. He said the leaders will try to boost the SAARC spirit and no bilateral issues will affect this.

As already reported, the South Asian heads of state and government will start gathering in Dhaka on Friday next for the two-day SAARC summit which begins on Saturday. All the regional leaders, except the Indian prime minister, will arrive in Dhaka on Friday. Mr. Narasimha Rao will arrive on Saturday morning. At the summit, the chairmanship of the regional forum will pass on to Prime Minister Begum Khaleda Zia from the current chairperson, Sri Lankan President Ranasinghe Premadasa. The Bangladesh government has taken maximum security arrangements during the summit.

ALGERIA

Action Plan To Resolve Water Shortages

93WN0334A Algiers LIBERTE in French 23 Feb 93 p 4

[Article by Laradj Mahdjouba: "Thirsting for a Solution"]

[Text] The drought that has affected all of the western regions of the country for the past 10 years has given rise to a water crisis without precedent. Worse still, the region's drinking water supply has never been adequate in relation to the needs of residents.

The city of Oran offers sobering proof of this state of affairs. Officials at the Ministry of Equipment, headed by Mr. Mokdad Sifi, have taken this crucial problem to heart and are attempting to have it solved by the year 2000. As part of the effort, the equipment minister traveled to western Algeria to conduct inspections and working sessions. The first stop on the minister's itinerary was the city of Temouchent where he visited a potable water treatment and storage station.

This important project was explained to the minister by local water officials. The station has an actual storage capacity of about 13 million cubic meters. Unfortunately,

the drought in this region has kept the level of water at an estimated 3 million cubic meters this year. This prompted the minister to instruct the appropriate authorities to enact an emergency plan. After visiting Oued-Tafna and Dziuoua, Mr. Mokdad Sifi traveled to Oran for a meeting with water officials and the governors of the western provinces.

During this working session, Mr. Mokdad Sifi presented the outline of an action plan to make better use of water resources.

The minister stated that this year his department has launched an ambitious action plan involving urgent operations to meet the water supply needs of residents by the year 2000, as well as waste-water evacuation, exploration, and irrigation. The minister noted that the action plan, which consists of seven broad categories, is primarily focussed on restoring networks so as to prevent future losses. The companies concerned will be urged to apply more rigorous management techniques, to recover payments owed to them, and to monitor their billing. With regard to waste-water evacuation and recycling, there are plans to build 110 water purification stations.

In response to the drought and Oran's water-supply problem, Mr. Mokdad Sifi stated that particular attention has been given to expanding Oran's drinking water supply by tapping into the Chlef River (500 million cubic meters a year).

INDIA

Government Identifies 19 'Critically Polluted' Areas

BK0804115993 Delhi INDIAN EXPRESS in English 31 Mar 93 p 6

[Text] New Delhi—The Government has identified 19 areas in the country including Najafgarh in Delhi, Vapi in Gujarat, Chembur in Maharashtra and Howrah and Durgapur in West Bengal as critically polluted areas, the Lok Sabha was informed on Tuesday.

Other such areas are: Parvanoo and Kalamb (both Himachal Pradesh), Dhanbad (Bihar), Talcher (Orissa) Vishakhapatnam (Andhra Pradesh), Korba (Madhya Pradesh), Manali-Madras and North Arcot (both Tamil Nadu), Bhadravati (Karnataka), Singrauli (U.P. [Uttar Pradesh]), Pali (Rajasthan), Gobindgarh (Punjab), Greater Cochin (Kerala) and Digboi (Assam).

Stating this in a written reply to Mr. Gopinath Gajapathi, the Environment and Forest Minister, Mr. Karnal Nath, said that 19 areas have been identified by the Government in consultation with the Central Pollution Control Board and the State Pollution Control Boards.

'State-Sponsored Destruction' in National Park Bemoaned

BK0804120793 Delhi INDIAN EXPRESS in English 31 Mar 93 p 9

[By Dilip Bisoi]

[Text] Soon, the majestic Bhitarkanika National Park in Orissa will see some new additions—a herd of bipeds! How else does one explain the State Government's recent

bizarre proposal to the Centre that a tract of mangrove forests be cleared to house some 400 families of illegal Bangladeshi immigrants.

The proposal involves clearing of over 1,300 acres of reserve forest land in the Sunei-Rupe area. The ruling Janata Dal [JD] party in the state has had its eyes on this patch for long. In fact, what has surprised is the haste with which the Government has pushed the project since coming to power. In early 1990, soon after Biju Patnaik assumed charge in the State, the Government sent a posse of workers to level the forest.

The Forest officials resisted the scheme tooth and nail, but they were shouted down by the Government. It issued an official order for the same, vide memo no IOF (cons) 7/91 2914 F & E dated May 10, 1991 of the Dept of Forest and Environment, Government of Orissa, [GO] contrary to the provisions of the Forest Conservation Act, 1980.

The GO caused irreparable damage to the park. Over 200 acres of precious mangroves were cleared. The Forest officials could only look on helplessly. Only the intervention of the regional office of the ministry of environment and forest prevented further destruction. The Bhubaneswar-based officials sent an SOS to the Centre seeking immediate intervention in the matter, and restraint on the State Government from mowing down forests.

The additional inspector general of forest directed the State Government to stop further work in the reserve forest. He also pointed out the provision of the Forests Act which requires permission to be obtained from the Centre for levelling forest land. This was not enough, though, and the ministry had to send numerous reminders before the State finally yielded. But the officials' victory seems to have been only momentary, and the JD Government is now trying another tack.

The Government submitted a proposal, for clearing the forest for human settlement under the Forest Conservation Act. And it is lobbying to push through the proposal. State Minister for Public Works Nalinikanta Mohanty is negotiating with the Centre, and his interest apparently stems from the allure of a vote-bank, as the immigrant Bangladeshis have apparently managed to enroll as voters.

If the project is approved by the Centre, there is no telling what harm it can do to the flora and fauna of the Park, besides doing irreparable damage to the fragile ecosystem. And environmentalists are sweating blood at the very thought of the storm that civilisation will unleash on Nature. The environmentalists' concern is understandable. Bhitarkanika, the second-largest mangrove forest in the country after the Sunderbans, is rich in rare species of plant, algae, fern etc, and plays host to rare and endangered species of reptiles like the estuarine crocodile, giant lizards and snakes like the king cobra and the python.

Moreover, the eastern part of the sanctuary, banking on the Bay of Bengal, is the site of a unique phenomenon. The exotic and endangered Olive Ridley turtles come in large numbers every year during their nesting season, and lay their eggs on a 35 km stretch on the Gahirmatha beach, the largest rookery in the world.

The park is also known for its bird sanctuary. Over 170 species including aquatic, migratory and resident birds have been spotted in the forest.

There can be no doubt that the destruction of a part of the mangroves, and the impact of the subsequent human habitation will disturb the ecological balance, to say the least. Even as it is, human demands have placed tremendous pressure on the Park. Activities like fishing, poaching, timber-smuggling and encroachment in and around the sanctuary have done nothing to help the ecosystem.

But all this activity is covert. If the Government's attempt to establish a human settlement inside the core area of the park comes through, it would be tantamount to sanctioning these nefarious activities. And the law enforcement agencies would be able to do nothing but gnash their teeth in frustration.

If the Centre has any pretence at serious environment-consciousness, it cannot afford to let this case slide. Bhitarkanika is an opportunity for the Narasimha Rao Government to prove its environment credentials. Or to expose its inability not only to bring an erring State Government to heel, but also to save one of the most valued bio-reserves from State-sponsored destruction.

ISRAEL

Murky Water, Fuel Spill Into Gulf of Elat

TA0104184393 *Jerusalem Qol Yisra'el in Hebrew*
1600 GMT 1 Apr 93

[Text] A malfunction in the water reservoir system in al-'Aqabah caused hundreds of thousands of cubic meters of murky waters to flow into the Gulf of Elat. The spill stretches from Elat's northern beach to the middle of the gulf. Our correspondent Yehudit Zilberstein reports that the malfunction was detected earlier this morning when dark water carrying clay deposits began flowing into the Gulf.

Israel approached Jordan via the Foreign Ministry and the U.S. Embassy, and asked it to stop the contamination at once. The Jordanians said there had been a malfunction in the reservoir pools of purified potable water used for irrigation.

Another spill occurred today in the Gulf of Elat during a fire drill aboard the oil tanker Niuta. During the drill, thick black fuel spilled into the sea and polluted the beaches. The station for prevention of sea pollution in Elat placed buoys and began to clean up the beaches.

REGIONAL AFFAIRS

Black Sea States Sign Sea Protection Declaration

LD0804082493 Moscow ITAR-TASS in English
2009 GMT 7 Apr 93

[By UKRINFORM correspondent Vladimir Novak - TASS]

[Text] Odessa April 7 TASS—A two-day meeting of ministers of environment protection from Bulgaria, Georgia, Romania, the Russian Federation, Turkey and Ukraine ended on Wednesday by the adoption of a declaration on protection the [as received] Black Sea.

The final document signed by the heads of delegations of the six countries envisages concrete measures to protect the Black Sea from pollution. Specifically it is planned to work out by 1996 coordinated national plans for decreasing outbursts of harmful substances and elimination of emergency situations, and introduce where it is possible low-waste and waste-free technologies. It was also decided to prohibit throwing radioactive materials into the sea, create and improve guarded territories in the coastal zone of each Black Sea state.

RUSSIA

Flora, Fauna 'Catastrophic'

93WN0346A Moscow MOSKOVSKIYE NOVOSTI
in Russian No 9, 28 Feb 93 p 5A

[Unattributed article: "The Hunters Are Not Playing on Equal Terms With the Wolves"]

[Text] Gennadiy Galkin, procurator of the Russian Federation Procuracy's Department of Oversight for the Fulfillment of Environmental Legislation, submitted some curious documents to the editors of MOSKOVSKIYE NOVOSTI.

They indicate that the Procurator General of Russia sent the Prime Minister a memorandum in which the current situation with respect to the conservation of animal and plant life in the Russian Federation is characterized by the word "catastrophic." Local authorities are grabbing lands assigned to state parks, national parks, and nature preserves. Local authorizations are being issued for geological-prospecting work, logging, and other purposes not in keeping with the conservation status of the protected territories.

Investigations have shown that illegal hunting of animals is rising all over Russia. This threatens the extinction of rare species of wild animals and birds. The autonomous republics, krais, and oblasts in the taiga region have stopped efforts to combat the illegal trade in furs. The situation is no better in regard to conservation of fish resources. It would be wrong to say that the fishing inspectorate has completely given up pestering poachers, but over 90 percent of the inspectors' "catch" consists of petty violators, while massive assaults on fish reserves on the part of commercial organizations are rarely stopped.

Corruption in the nature conservation organs has reached fantastic proportions. Suffice it to say that state inspectors of the Okhotsk Fishery Association, who were supposed to "monitor fishing operations," were getting hard currency

"expenses" from the joint enterprises Magadan-Gege Godo, Primsico, and Caliph International, which they should have been officially restraining. The head of the Hunting Administration in Smolensk Oblast successfully combined his official job with that of being the cofounder of a commercial firm which organized hunting tours for hard currency, with the grossest violations of hunting rules.

In the opinion of the Procurator General, this situation has taken shape as a consequence of the mistaken decision to convert federal departments to a self-recoupment footing. For example, the hunters of the Main Hunting Administration, forced to engage in commercial activity on which their earnings now directly depend, are paying less attention to unprofitable sectors and closing their eyes to violations when it's a question of profit.

In the opinion of several experts, the scientific programs connected with the extraction of sea produce in commercial quantities are extremely ineffective and serve, apparently, only as a cover for illegal commercial activities. In the Far East, crab-fishing operations "for scientific purposes" reached 4,500 tonnes (the Okhotsksuysan joint enterprise was hired for the job), whereas the quota for domestic fishing companies is only 300 tonnes.

The natural world is in jeopardy from a situation in which government departments themselves conduct scientific research, engage in commerce, protect natural resources, and are themselves the watchdogs over all this. For example, the Russian Ministry of Agriculture currently has under its authority organs of fish conservation and scientific-research institutes of the fishing industry. An attempt by the Ministry of Ecology to bring them under its own roof in accordance with a ruling by the Russian Federation Government Board was blocked by Minister of Agriculture Viktor Khlystun and First Vice Premier Vladimir Shumeyko.

And our grandchildren will be puzzled—how did all the crabs die out?

Fifty Unsafe Nuclear Reactors in Moscow

LD1304084393 Moscow Mayak Radio Network
in Russian 0700 GMT 13 Mar 93

[Text] IMA-PRESS reports that there are 50 unsafe nuclear reactors in the Russian capital. Vladimir Kuznetsov, chief of inspectorate of the Russian Federation State Supervision Agency of Nuclear Power Capabilities, shut down two of them at the Kurchatov Research Institute. Within two weeks he resigned at his own request. As for all the dangerous installations, they continue to function. Most of them were designed at the end of the 1950s and fail to meet the safety requirements of today. The Kurchatov Institute alone has 25 nuclear installations. The total level of radioactive waste buried in the Institute's storage facility is 20 times over normal limits. Listeners will be able to read details about this in tomorrow's edition of LITERATURNAYA GAZETA.

Arkhangelsk Skin Cancers Linked to Ozone Hole

93WN0350B Moscow ZELENYY MIR in Russian
No 8, Mar 93 [Signed to press 24 Mar] p 2

[Unattributed article under "Northwest" rubric: "Impact of Ozone Hole Determined"]

[Text] At the height of summer, sunbathing on the White Sea is dangerous. Arkhangelsk scientists, medics and ecologists have come to this conclusion based on a study of the ozone hole's impact on northerners' health. A special research group that studies the natural phenomenon, led by Professor P. Sidorov of the Arkhangelsk Medical Institute and V. Kozlov, deputy director of the Institute for Ecological Problems, has confirmed that as a result of an inadequate supply of ozone in the atmosphere over the summer period, northerners react unhealthily to the harsh ultraviolet radiation in the area—their sensitivity to the sun's rays is decreased by 20 times. It is as if the North has caused them "forget their training," and while a northern tan will not harm southerners, for long-time residents of the Arkhangelsk North, it is dangerous—it is no accident that medics here are registering a progressive growth in skin cancers. Scientists recommend that northerners do their summer sunbathing in the South, and sunbathe at home in the winter—under a tanning lamp.

Moscow Fights Losing Battle Against Air Pollution

93WN0350C Moscow ZELENYY MIR in Russian
No 8, Mar 93 [Signed to press 24 Mar 93] p 2

[Article by V. Nekrasov, Moscow Ecological Federation member, and G. Skvortsov, Kuybyshev Raysoviet people's deputy, Moscow Ecological Federation member, under "Moscow" rubric: "Largest Exporter of Contaminants"]

[Text] More and more often a gray cupola of dust and gasses hangs over Russia's capital city, Muscovites gasp from the poisonous contaminants in the air, and the physico-chemical processes that are breaking down the city's material valuables grow. Yes, and would it be possible to obtain different results with average capital investments for the preservation of atmospheric air in the capital of up to 15 kopecks for each person? On the average for the former USSR, over the years 1986-1990, 1.16 rubles went towards these goals. According to statistical accounts, the total volumes of emissions of harmful substances into the atmosphere in Moscow is being decreased yearly.

This "positive tendency" is the result not of steps taken to decrease emissions of air contaminants, but of an artificial lowering of the number of stationary sources for discharges of solid, gaseous and liquid substances. If in 1989 the volumes of emissions of harmful substances was calculated for 817 enterprises (the actual number of industrial and automobile transport enterprises, power stations, heat and power plants and boiler rooms is several thousand), then in 1990, it was only calculated for 526. Nor is a "decrease" in the volumes of emissions of harmful substances observed in automobiles,—the volumes of lead compounds that end up in the atmosphere from ethyl gasoline, which is forbidden in the city but is still in use, are not taken into consideration, nor is the volume of air pollution from peripheral automobile traffic moving along the ring automobile road.

Perceptible damage to Muscovites' health is caused by 264 industrial facilities, within whose health protection zones are located 369 residential buildings (where more than 100 thousand people reside), 86 children's preschools and schools, 25 treatment and preventive medicine facilities.

Mortality for Muscovites per 1000 people is 14.3 percent higher than the average for inhabitants of Russia. And the mortality coefficient in Moscow is growing every year (in 1990 it grew in comparison with 1986 by 11.3 percent). The still forming child's organism is the most susceptible to changes that occur in the environment. Illness in children (out of 1000 people) exceeded the average values for Russia by: for respiratory illnesses—1.8 times, for digestive tract diseases—1.9, for illnesses affecting the nervous system and sensory organs—1, for illnesses affecting all forms of new growth—3, for urinary and reproductive system illnesses—3.4 times, for skin problems—by 44.3 percent, for congenital defects—by 44.2 percent.

The main reason for the pollution of Moscow's atmosphere by industrial facilities is the incredibly small portion of emissions sources that are equipped with gas-purification and dust-catching installations. As a study of drafts of ecological certificates shows, enterprise and organization directors are refusing to introduce purification devices for economic reasons. It turns out that the expenses for acquiring and servicing these devices is greater than the established fees for emitting polluting substances into the environment. It is exactly due to this lack of incentive for introducing atmospheric protection equipment that the Izolit MOZ and Moscow Furniture Factory No. 4 have extremely low percentages for catching contaminants, and at the Tenth Bus Stall, out of 51 sources of emissions, only one is catching harmful substances. In 15 Moscow rayons, the indicators for catching harmful substances are less than 44 percent, and for Gagarinskiy, Solntsevskiy, Leninskiy, Sevastopolskiy, Kuybyshevskiy—they are only 2 to 9 percent.

A substantial role in the formation of the capital's medical conditions, highways and roads is played by automobile traffic, which accounts for over 70 percent of the harmful emissions released into the atmosphere. The poisoning of the air by exhaust fumes from automobiles is occurring on a threatening scale in the city. There is a fairly significant number of regularly contaminated streets and squares, where not only residence, but temporary human presence is inadmissible. In developed states, negative factors of this type are prevented first off by a working automatic municipal system that gives warning when the air is excessively contaminated, and that provides not only for suspending production at the main air polluting enterprises, but that also stops automobile traffic. People here are ecologically unprotected. The state of the air supply around, for example, a bus station, typically exceeds norms for phenol by 1.2 times, for formaldehyde by 2.9, for nitrogen dioxide by 2 times, and carbon monoxide by 10 times.

In addition to toxic and carcinogenic substances, high concentrations of carbonic gas, which comprises up to 10-12 percent of carburetor and diesel engine exhaust fumes, also have a harmful impact on the population and the environment. According to our estimate, the daily amount of emissions of carbonic gas into Moscow's atmosphere is around 7-9 thousand tons—several million tons a year! Of course, the indicated mass of gasses is not distributed over the city's territory equally. Constant accumulations on certain highways and roads with excessive numbers of automobiles create zones with enormous

concentrations of carbonic gas, which has an extremely negative effect on people's health.

The green belt in Moscow and the Moscow area is constantly narrowing. For every Moscow resident, there are fewer than 18 square meters of green plants, which is significantly less than the established norm. After all, the demands made by the city's automobiles for oxygen are growing—the yearly growth in parking spaces is 30-35 thousand units. We remind you: 15-17 grams of air are required for the combustion of only one gram of gasoline in carburetor engines.

Moscow is the greatest "exporter" of contaminants to other regions of the country.

Today, people are joining together under the slogan "Profit—today and tomorrow, environmental protection—later." But today, the living conditions for the 9 million residents of Russia's capital are bad right now.

V. NEKRASOV,
Member, Moscow Ecological Federation

G. SKVORTSOV,
Kuybyshevskiy Raysovet people's deputy,
Member, Moscow Ecological Federation

Defense Industry Impact on Environment Assessed

93WN0322B Moscow ROSSIYSKIYE VESTI
in Russian 19 Mar 93 pp 3, 4

[Article by Vladimir Karasev, responsible secretary of the Ecological Policy Council under the president of the Russian Federation: "The Defense Industry Is Destroying the Natural World, But Can Help It Too"]

[Text] It didn't used to be the custom to talk about this. But after having decided to tell people the truth, we must tell them about the defense industry too. The complex of the defense structures and defense sectors of industry is one of the main sources of pollution of the natural environment. Because of the perpetual secrecy, unfortunately, the protection organs of nature do not have exhaustive and reliable information which allows them to completely assess the amount and scale of detrimental effects. But according to expert assessments, we can compare the level of overall anthropogenic impact on the natural environment as a result of the operation of the defense industry with the detrimental effect on the natural world of the economic activities of all the other sectors combined.

Military activity involves a heightened risk of adverse impact on the environment and people, so from the standpoint of solving ecological problems it has a number of distinctive features. First, military activity consists of ensuring that means and methods of destruction and annihilation are ready to be employed (or are employed). Secondly, it proceeds from the idea that the goals of the military security of the state have priority over all other goals of economic activity.

The army and the navy are deployed throughout the territory of the entire Russian Federation, including in regions with adverse ecological situations resulting from long-term anthropogenic impact on the environment. According to evaluations of specialists of the Ministry of

Defense of Russia, the most adverse ecological conditions are in the Ural and Moscow military districts.

There are 12.8 million hectares of land assigned to the Ministry of Defense, including 5.1 million hectares of forests. Military infantry ranges have a total area of 1.3 million hectares. The need to comply with measures to ensure secrecy makes ecological monitoring activities much more difficult, at least for the regional environmental protection organs. So to date military activity has not been reviewed and has not been optimized from the standpoint of ecological safety, although this activity is highly intensive and broad in scale.

During the years that the Plesetsk test range in the northern regions of Arkhangelsk Oblast was in use, more than 8 million hectares were heavily contaminated as a result of the jettisoned parts of booster rockets carrying residual components of liquid rocket fuel. Liquid fuel components are categorized in the prime hazard class. The situation is made more complicated by the lack of highly efficient technologies to clean up the consequences of accidental fuel spills and detoxify soil and bodies of water, especially in regions which are difficult to get to (swamps, mountains, and tundra).

During the implementation of the Start-1 and Start-2 treaties in the years 1993-2001, about 100,000 tonnes of highly toxic components of liquid rocket fuel will have to be removed from units of the Strategic Missile Troops, which involves a certain risk.

The problem of rocket fuel exists in the Air Defense Troops too. Because of the conversion to new types of missiles, toxic components of rocket fuel of old systems are being stockpiled; altogether they total about 30,000 tonnes.

The radiation-ecological situation in the regions near naval bases has developed as a result of air, land, underground, and underwater nuclear explosions conducted (for experimental purposes) beginning in 1957, the creation and deployment of the fleet of atomic submarines and surface ships with nuclear power plants (NPP), the construction and operation of experimental reactors and training devices, the accumulation and storage of nuclear fuel wastes and radioactive wastes (RAW) at shore and technical bases and ship complexes, the discharge and burial of RAW in the sea caused by accidents, and the cross-border migration of radionuclides in the water and air.

On Novaya Zemlya there are localized zones with a heightened level of radioactivity after the atmospheric tests of nuclear weapons conducted there. The scale and amount of contamination can be ascertained after a thorough study of the entire test range which is 90,200 square kilometers in area.

The creation and deployment of ships with NPP's required the construction and equipping of ship building and repair yards, naval bases, sites for storing and recycling decommissioned ships, and sites for burying spent nuclear fuel.

The operation of nuclear submarines and surface ships with NPP's led to the emergence of the problem of the handling of radioactive wastes. However, the shore facilities for waste processing that were built in the 1960s at the recommendation of the USSR Ministry of Medium Machinebuilding were

not put into operation. For this reason, beginning in 1960 the Navy began the practice of regularly discharging RAW into the sea. The selection of marine regions for dumping liquid and burying solid radioactive wastes was made by the headquarters of the Northern and Pacific fleets and approved by Main Naval Headquarters in 1966-1967. A large part of the burials in the sea were done in the USSR in the period from 1959 to 1976, that is, before the London Convention went into effect.

Most of the solid radioactive wastes buried in the northern seas are low level and medium level radioactive wastes. They were sunk in containers or inside barges, lighters, and tankers. Of all the burials in the northern seas, sunken objects with nuclear fuel wastes represent the greatest ecological danger; they include six reactors with spent fuel that was not discharged and one shield assembly of the atomic icebreaker Lenin with partially dumped fuel wastes. Ten reactors are also buried in the bays of Novaya Zemlya and the Kara Sea.

The radiation conditions after 1967 in water areas 50-100 kilometers from the regions of buried solid nuclear wastes were studied. Monitoring of the radiation conditions in the actual regions where these wastes were buried has not been done for more than 25 years.

Questions of petroleum spills and leaks and pollution of the environment with lubricants are an equally important problem in the Armed Forces. Every year the army and navy forces use a total of more than 10 million tonnes of these materials. More than 50 percent of the capacities of warehouses, equipment, and pipelines were built back in the 1950s. A number of installations lack elementary environmental protection structures and there is virtually no automated pumping. As a result virtually every installation has significant fuel leakage. Petroleum products end up on surface bodies of water and in underground water horizons where large lenses are formed.

The vital support systems of military units located in cities are connected to the city municipal services systems. Moreover, within the structure of the Ministry of Defense of Russia there are more than 1,200 large installations with self-contained vital support systems. Many of these installations do not have decontamination structures. Thus, in some of the garrisons of the Far East Military District, waste water from the housing and municipal services systems is discharged without any treatment at all. A serious situation has developed in the regions of naval bases. At this time 453,000 cubic meters of waste water a day are discharged from shore installations, and slightly more than half undergoes treatment. Navy ships and vessels do not have on-board waste recycling and every day 15,000 tonnes of waste water and sewage are discharged into the sea. So the problem of decontamination facilities is becoming a dominant one.

The saturation of the Armed Forces with contemporary types of powerful equipment and its operation have a significant physical impact on the environment and the population. Aviation occupies a special place in the problem of the effect of noise on human health. Most air bases are near populated points. Electromagnetic radiation has a significant effect on the environment and people. Various types of radar units, radio relay communications

lines, and radio broadcast centers are the most powerful sources of this radiation. In some regions the radiation reaches critical levels.

Nuclear power engineering is a multifaceted and complex mechanism saturated with various kinds of production facilities. The nuclear fuel cycle is potentially the most dangerous. Each power plant has its own ecological problems. Some enterprises and installations, especially the Mayak Production Association (or Chelyabinsk-65), Tomsk-7 (the Siberian Chemical Combine), and Krasnoyarsk-26 (a mining and chemical combine) are extremely dangerous environmental polluters.

The operation of Mayak for more than 40 years has resulted in localized build-up of large quantities of radionuclides and substantial contamination of the Urals Region (rayons in Chelyabinsk, Yekaterinburg, Kurgan, and Tyumen oblasts). The region of the sanitary-protection zone of about 270 square kilometers between the Techa and Mishelyak rivers has an abnormally high radiation load. Wastes from radioactive chemical production are concentrated here, and a substantial part of them have been deposited in open natural habitats: in the water and bottom deposits of bodies of water. A lens of underground radionuclide-contaminated waters of some 10 square kilometers has formed in the region where the radioactive wastes are buried.

Almost all the solid wastes are buried here without processing because the country does not have extrusion, decontamination, incineration, and fusion installations. Liquid radioactive wastes are stored in stainless steel tanks set in reinforced concrete enclosures with metal jackets. Medium level radioactive wastes are discharged into reservoirs after neutralization. Lake Karachay has become one of the main sources of aerosol contamination of the air basin with long-lived radionuclides. It has been established that the radionuclides from Lake Karachay end up in underground water horizons. During the 40 years that the reservoir has been used, the underground flow has spread kilometers and reached the Mishelyak River.

During a year the sector's enterprises discharge 9.11 billion cubic meters; of this 9.08 billion cubic meters are discharged into surface reservoirs. There are 133 enterprises which discharge harmful substances into the atmospheric air. During the last year 76 of them increased the discharge of harmful substances into the atmosphere.

Ensuring the safe operation of nuclear power plants remains a serious problem. Thus, in 1991 there were 165 violations in the work of the power units at AES's, and two of them were classified as serious (according to the international scale of radiation danger of incidents at AES's). The latter include the contamination of production areas at the Bilibino AES while wastes were being transported to the storage facility and the violation of the rules of the booster process at the Smolensk AES.

According to Roskomoboronprom [Russian Committee for the Defense Industry] data, about 650,000 tonnes of harmful substances are discharged into the atmosphere from stationary sources in the defense sectors of industry every year. About 3 million tonnes of solid industrial wastes are formed at enterprises of Roskomoboronprom of

Russia every year, and of this roughly 35 percent are recycled, while the rest are stored in industrial sites or hauled to dumps.

This includes, according to Ministry of Nature of Russia data, production facilities of the space rocket sector, which is not among the most environmentally polluting sectors; they discharge about 75,000 tonnes of toxic compounds into the atmosphere every year and roughly 55,000 tonnes into surface bodies of water. More than 250 regions with a total area of roughly 50 million hectares have been taken out of economic circulation for use as sectors where the jettisonable parts of launch equipment can fall and for other needs of space rocket equipment. A significant part of these territories (in Arkhangelsk Oblast, in the Republic of Sakha, and other places) has been contaminated with unburned remains of highly toxic rocket fuel whose decay period, especially given low temperatures and permafrost, runs into thousands of years. In 1985 as the result of an accident a Tsiklon rocket with a meteorological satellite on board, whose two-component fuel included highly toxic heptyl, fell into the Northern Dvina, broke through the ice, and sank to the bottom.

So, we have named the damage done to the natural world and humans quite truthfully. But what now? The opinion exists that one of the mechanisms for carrying out conversion in the interests of environmental protection is ecological conversion programs. Within their framework the possibility appears to realize state policy in the sphere of the production of nature protection equipment as well as to strictly control the assortment and quality of this output.

The Federal Scientific-Technical Program "Conversion-Ecology" project may serve as an example; it was developed in 1992 by the Russian Federation Ministry of Protection of the Environment and Natural Resources at the order of the Russian Federation Government. During the realization of this program in 1993-1994, the latest types of decontamination and ecological monitoring equipment, ecologically clean technologies, and so on are to be created. In subsequent stages the "Conversion-Ecology" program will be supplemented with a production stage for series production of nature protection output developed in the first stage.

We believe that in order to fundamentally improve the nature protection activity of the defense industry and preserve its scientific production potential, we must create targeted ecological funds to solve applied nature protection problems. That is the first thing. Secondly, exempt ecology work from paying the value-added tax as well as from paying the tax on profits from the production of nature protection equipment and instruments.

The Armed Forces' potential in the area of environmental protection and ecological safety can be used in various directions, and very effectively. The following are those directions:

monitoring the state of the environment;

enlisting the equipment of chemical and engineering troops in order to track the condition of the environment and identify its contamination with toxic and radioactive substances;

utilizing the capabilities of the Russian Navy to monitor the condition of marine water areas and to work on finding chemical weapons and radioactive wastes submerged in seas, as well as to participate in measures to neutralize the pollutants found;

receiving remote-sounding information from space reconnaissance and aviation equipment in order to perform the tasks of ecological control and rational nature use;

utilizing the capabilities of communications troops to transmit ecological data;

utilizing coast guard vessels to protect fish and other resources of Russia's marine water areas.

It would be wise to do the following in order to restore disturbed natural objects:

Enlist the technical means of engineering and chemical troops to rehabilitate territories removed from economic circulation as a result of detrimental anthropogenic effects.

Utilize the technical capabilities of engineering and chemical troops to provide protection for the population of regions subjected to contamination with toxic chemical and radioactive substances.

Utilize the laboratory base of scientific research and educational institutions of the Ministry of Defense of Russia to carry out measures to identify and analyze sources of contamination of the environment with dangerous chemical and radioactive substances.

Have military medical institutions participate in measures to normalize ecological conditions in the worst regions.

There are a number of other possibilities. Examples are transferring equipment released during the reduction of the Armed Forces to nature protection inspection organs; using mobile chemistry laboratories to collect and monitor samples in regions which have been subjected to chemical and radioactive contamination; and using the rear services of the Armed Forces to provide control-inspection services with the necessary instruments, equipment, materiel, and uniforms.

Few Regions of Moscow Remain Ecologically 'Clean'

*93WN0346B Moscow RABOCHAYA TRIBUNA
in Russian 30 Mar 93 p 2*

[POSTFAKTUM article: "No More 'Clean' Regions in Moscow"]

[Text] According to forecasts by specialists in the Institute of Mineralogy, Geochemistry, and Crystal Chemistry of Rare Elements (IMGRE), practically no "clean" regions remain in Moscow in 1993. According to the institute's data the area of "contaminated" soils in the city rose from 100 square kilometers in 1977 to 600 square kilometers in 1987. The average concentration of heavy metals

increased by a factor of 8, the maximum concentration by a factor of 20. The city's West sector is considered to be the "cleanest" in terms of soil conditions, while the East sector is the most "contaminated."

Specialists have noted that public health depends on the condition of the soil. Tests carried out in eight cities around Moscow show that in contaminated districts children's illnesses are more frequent.

Soviet Union Dumped Two Nuclear Reactors in Sea of Japan

OW0204042693 Tokyo KYODO in English 0155 GMT 2 Apr 93

[Text] London, April 2 KYODO—The former Soviet Union dumped two reactors in the Sea of Japan in 1978 and 16 others in the Kara and Barents Seas between 1966 and 1991, the environmental group Greenpeace said Thursday [1 April].

Greenpeace said a Russian Government report on the disposal of radioactive waste in waters surrounding Russia established that the former Soviet navy had been dumping radioactive material since 1959.

It said the Soviet Union dumped two reactors in 1,000-meter deep waters, about 700 kilometers north of Fukushima, western Japan, or off North Korea.

The level of radiation of the two reactors is estimated at 1.7 trillion becquerels. Greenpeace said the level is comparatively low because they have no fuel.

Of the other 16 reactors, six contain fuel. They, having a total radioactive content of 85,000 trillion becquerels, were dumped in the Kara and Barents seas, the report said.

The Soviet navy continued dumping radioactive waste in the Barents Sea, as well as of liquid and solid radioactive waste in the far eastern seas in 1991 and 1992, the report said.

The report also detailed a serious accident during a reactor refueling operation at Chazma Bay in the Russian Far East in 1985. As navy workers removed a reactor lid, the control rods were lifted, leading to "an uncontrolled spontaneous chain reaction."

The report said 10 men died and surrounding areas were seriously irradiated.

The report said the former Soviet Union did not give the International Maritime Organization or the International Atomic Energy Agency any information about the dumping.

The report was submitted to President Boris Yeltsin in February.

The commission of inquiry on questions relating to the dumping of radioactive waste at sea was chaired by Alexey Yablokov, a presidential special adviser on environmental and health issues.

It was set up three days after the Greenpeace ship Solo was released by Russian authorities late last year, the environmental group said.

The Solo was attempting to document the sinking in 1981 of a damaged nuclear submarine together with two nuclear reactors off Novaya Zemlya in the Kara Sea.

The greatest potential danger is from the reactors of nuclear submarines and the screen assembly of the atomic icebreaker Lenin with spent nuclear fuel, dumped in a shallow bay of the archipelago Novaya Zemlia, the report said.

Greenpeace called on U.S. President Bill Clinton and Yeltsin to bring to an end the era of nuclear-powered navies by declaring a nuclear propulsion ban.

Japanese Technical Aid For Nuclear Waste Disposal, Not Affect Financial Aid

OW0504092793 Tokyo KYODO in English 0903 GMT 5 Apr 93

[Text] Tokyo, April 5 KYODO—Japan may offer technical know-how to Russia on land disposal of nuclear waste following revelations that the former Soviet Union dumped radioactive material into the Japan Sea, the top government spokesman said Monday.

Chief Cabinet Secretary Yohei Kono also signaled that Japan would not use the nuclear dumping issue as an excuse to withhold economic assistance from Russia.

"We are very concerned, but the (dumping) has been going on for the past 30 years...and Russia is saying it did not have land disposal facilities," Kono told reporters when asked whether Japan would find it difficult to offer financial assistance in light of the secret dumping at sea.

"We are thinking of offering technology. We do not anticipate this will have an immediate impact on aid to Russia," Kono said.

A Russian government report made public by the Greenpeace environmental group last week said the former Soviet Union dumped two nuclear reactors in the Sea of Japan in 1978, and 16 others into the Kara and Barents Seas between 1966 and 1991.

Russia's presidential spokesman on coastal policies said in Niigata on Sunday that Russia will not dump any more radioactive waste into the sea.

Kono said the Science and Technology Agency was convening a meeting of senior officials to discuss offering technical assistance on land disposal, and cooperation in monitoring the ocean for radioactive contamination.

Japan has received a copy of the Russian report on radioactive waste disposal, and has asked Moscow to cease the sea dumping immediately, Kono said.

Komsomolets Expedition To Provide Data on How To Enclose

LD0404144393 Moscow Mayak Radio Network in Russian 0620 GMT 4 Apr 93

[Text] Our commentator Vladimir Mikhaylenko has just come into the studio with an interesting guest. Four years ago, on 7 April 1989, the atomic submarine "Komsomolets" sank in the Norwegian Sea. An expedition is likely to be sent to the site in the very near future by the Russian

Government Committee for Special Underwater Operations. The chairman of that committee, Doctor of Technical Sciences Tengiz Nikolayevich Borisov, is here with us now on "Panorama." Tell us the details, Tengiz Nikolayevich.

[Mikhaylenko] What is the aim of the expedition? How do you see it?

[Borisov] What we have to do at the present time is to obtain certain precise data on the condition of the submarine which will be needed when he makes a final decision on how best to seal and mothball it on the seabed. Previous expeditions have given a general picture of the submarine's condition, of the condition of the mechanisms, of the reactor and equipment. At the same time, in order to make a final decision, we need more precise information on certain things.

[Mikhaylenko] Tengiz Nikolayevich, I would like to clarify something. There were nuclear warheads—or missiles with nuclear warheads—on board the submarine. How many are there and what state are they in?

[Borisov] Well, there were two torpedo missiles with nuclear warheads on board. At the present time, no leakage of fissile substances from them has been discovered, but increased electrochemical corrosion could mean that there is a danger of this in the next year and a half to two years. We think the plutonium could begin to leak into the sea. Our task is to prevent that at all costs. The most realistic option at the present time is to mothball the submarine in situ, on the seabed.

In view of the fact that there is fairly extensive damage to the pressure hull as a result of the accident, raising the vessel is practically ruled out, for the present at least.

[Mikhaylenko] The submarine lies at a depth of 1,680 meters. Divers do not work at that depth. Television sounding and investigation of the submarine has been carried out. How does it look at the present time? What did the soundings show? What did the television camera reveal?

[Borisov] Those investigations were carried out by the Central Design Bureau of Deep Sea Technology, jointly with the Russian Academy of Sciences. The expedition used two manned deep sea craft, Mir-1 and Mir-2, and indeed by visual inspection and by means of television technology it proved possible to get into some of the cavities of the submarine through the damaged hull, through the [word indistinct] shields of the torpedo apparatus, and to establish that there are cracks and breaks in the pressure hull which, as I said, are an obstacle to raising the vessel at the present time.

[Mikhaylenko] Tengiz Nikolayevich, is such an operation technologically possible? To create some sort of sarcophagus at that depth must be extremely difficult. What material will it be made of?

[Borisov] You know, it can be done in principle. A sarcophagus could be made on shore, towed out, and very carefully lowered on to the submarine. That option has been considered from the very beginning. But the seabed on which the submarine lies was found to be soft and it will not support a heavy sarcophagus. Now other options are being examined. In particular, we could use the hull itself

as a sarcophagus, by pumping into it a special compound which, when polymerized, would keep the seawater away from the warheads and the reactor and stop any leakage of fissile materials. It has been suggested that absorbent elements be added to the compound to take up the fission products or heavy metals.

[Mikhaylenko] Is that possible? Has it been tried before?

[Borisov] In principle it has never been done. We have no experience of it. Some quite extensive scientific research is now being done on this. The main organizer of the work at the present time is the Rubin Central Design Bureau which I mentioned. The organization of all types of work and the task of carrying them out is the responsibility of the government committee for special underwater operations.

[Mikhaylenko] When will the expedition begin?

[Borisov] We are planning the expedition for July-August of this year.

[Mikhaylenko] Tengiz Nikolayevich, there is a great deal of rumor and inaccurate talk that the causes of the wreck of the "Komsomolets" nuclear submarine are knowingly and deliberately being covered up. As a submarine officer, as a scientist, and one who was for many years responsible for the viability of the submarine, while you were serving aboard her, what is your account of the matter?

[Borisov] As I see it, it was an ordinary accident, a tragedy against which unfortunately no one is insured at sea. You see, even a small mishap on a ship, if not localized in time, has a knock-on effect: More and more mechanisms break down, the disaster escalates, and as a rule the boat is lost.

There is a critical time in which something can be done to save the vessel, very quickly. It is a matter of minutes, usually. In this situation, the boat displayed splendid viability, in that just over four hours passed between the moment when the disaster began and the loss of the vessel, and quite honestly, it is surprising that it should have stayed afloat as long as it did.

It should be said that in all probability it would be wrong to accuse either the crew or the designers. Most likely, events developed in such a way that there was nothing the crew could have done at that moment, and the commission did not find any design faults in the vessel, apart from the minor deficiencies that are a feature of practically every complex technological product. So I cannot say anything definite at this moment, as—and in principle no one can—but that the causes of the loss of the vessel are not being covered up. I can guarantee: They are simply unknown. There are various more or less probable theories which are now being checked, and perhaps some things will become clearer after the expedition.

[Mikhaylenko] May we expect that our correspondent will be included in your expedition?

[Borisov] You know, that would probably be very difficult because there will not be much space aboard. The specialists are being very strictly selected and it really would just be an extremely difficult problem.

[Mikheylenko] But it could be considered?

[Borisov] It could be considered. In any case, I promise you that you will receive all the materials when the expedition is over.

[Mikheylenko] Well, let us wish this unique expedition success. At our microphone was Tengiz Nikolayevich Borisov, who is chairman of the Russian Government Committee for Special Underwater Operations. Thank you.

Yeltsin Promises No New Nuclear Tests

LD0604131493 Moscow Mayak Radio Network in Russian 1230 GMT 6 Apr 93

[Text] Russia will never start a new round of nuclear tests, President Boris Yeltsin asserted in a conversation with Aleksey Yablokov, his adviser on ecology, before leaving for Vancouver. The adviser revealed this at today's news conference on protection of the environment. He also said that 14 percent of Russia's territory can at present be regarded as ecological risk areas. To a significant extent, buried radioactive waste pollution comes from such sources as Chernobyl, Semipalatinsk, Tomsk, and Krasnoyarsk-26. Radioactive waste buried underwater also causes serious concern.

Fifteen Years To Reach Western Nuclear Safety Standards

OW0604131593 Moscow INTERFAX in English 1227 GMT 6 Apr 93

[Following item transmitted via KYODO]

[Text] It will take Russia about 15 years and \$60 Mn [million] to bring the safety standards of its nuclear power plants to the Western level, the president's adviser in environmental issues Aleksey Yablokov announced during a press conference on April 6.

He believes that environmental pollution is the first major cause of death before the age of 70. He also said that Russia spends 1

of its gross national product on solving its ecological problems. However, at least 5

of the gross national product should be spent to ensure a meaningful improvement in the environmental situation not only in individual zones, but in the whole of Russia. Unfortunately, we can't spend so much at the moment, said Yablokov.

Asked about the pollution of the environment by the defense enterprises, Yablokov said that in his opinion "in what concerns chemical and biological conversion, the military do not tell us the whole truth and sometimes deceive us," he said. In view of this, he proposed setting up a team of independent experts with the right to study classified documents.

Speaking about the ecological situation in Moscow, Yablokov said that from 40 to 50 points of radio-active contamination are revealed in Moscow daily. Moscow is also badly polluted with heavy metals, he added. But the worst damage on the city is inflicted by the transport, he said in conclusion.

Adviser Claims Four Million Under 'Ecological Risk'

LD0604142093 Moscow ITAR-TASS World Service in Russian 1222 GMT 6 Apr 93

[By ITAR-TASS correspondent Veronika Romanenkova]

[Text] Moscow, 6 Apr (ITAR-TASS)—Fourteen percent of the Russian Federation's territory, populated by about four million people, can be described as ecological risk areas, with a substantial share of environmental pollution coming from such sources as Chernobyl, Semipalatinsk, Tomsk, and Krasnoyarsk-26. This was stated today by Aleksey Yablokov, ecology adviser to the Russian Federation president. Speaking today at a news conference on environmental protection, Aleksey Yablokov stated that radioactive waste buried on the sea bed causes serious concern. Speaking about the future of the "Komsomolets" submarine, Aleksey Yablokov stated that it is crucial either to have the submarine lifted or to ensure that it will be absolutely harmless if stays on the sea bed. Incidentally, "Komsomolets" is the first submarine with a titanium hull. Titanium in contact with steel can accelerate erosion and corrosion. In two years' time at the latest we may find right in the water the six kilos of plutonium which are now on board the submarine.

Asked about potential Western aid to Russia to resolve its ecological problems, Aleksey Yablokov underscored that international contacts are necessary; However, cooperation will be carried out on a bilateral basis.

Recycling Approach To Nuclear Waste Suggested

PM0704100193 Moscow IZVESTIYA in Russian 6 Apr 93 First Edition p 8

[Nikolay Burbyga report: "Reliable Storage Needed For Nuclear Waste"]

[Text] In issue No. 53 IZVESTIYA reported that the Russian Ministry of Atomic Energy, together with 47 Russian Federation institutes, has embarked on work to set up the second radioactive waste storage facility in the Far East near the settlement of Bolshoy Kamen in Maritime Kray's Shkotovskiy Rayon, where it allegedly plans to bury the 27 nuclear reactors removed from dismantled Pacific Fleet submarines. This report was disseminated by POSTFACTUM citing Valeriy Butov, the Russian Federation president's representative in Maritime Kray. But in issue No. 56 Valeriy Butov categorically denied the report.

So is a storage facility planned for Maritime Kray or not? I put that question to the Ministry of Atomic Energy.

"I cannot say anything about the specific site," Vitaliy Nasonov, deputy head of an administration, reported. "All the work is being done under the auspices of the Navy. We, by government decree, are only involved on technical issues."

Rear Admiral Vladimir Uryvskiy, chief of a Navy directorate, said the following in response to a question from your correspondent:

"We currently have no actual construction plans."

It turns out that construction is not planned for Maritime Kray. But, at any rate, it is now clear that a primitive burial

of nuclear compartments and reactors is environmentally dangerous. This newspaper has learned that several scientific organizations headed by the "Dekom" joint-stock company have proposed that the government give up burying reactors. Instead it has been proposed that dismantling [razdelochnyy] complexes be set up which could recycle both the compartments and the reactors themselves. And only after this would the remaining units be buried. In the opinion of specialists, this process would be far more expensive, but it would rule out any possibility of radiation leaks even after many years of burial.

Navy Chief Says 'No Cause for Concern' About Nuclear Waste Dumping

*PM1304074393 Moscow Russian Television in Russian
1600 GMT 6 Apr 93*

[From the "Vesti" newscast: Video report by M. Voznesenskiy and V. Dymovidov, identified by caption; figures in brackets denote broadcast time in GMT in hours, minutes, and seconds]

[Text] [161814] [Voznesenskiy over video of submarines] Between 1959 and last year Russia dumped liquid radioactive waste with a total radioactivity of 12,300 curie, and half that quantity of solid waste, into the sea in the Far East. In the North the figure runs into millions of curie. Seven submarine reactors were sunk in a dangerous condition [avariynoye sostoyaniye] without the nuclear fuel being removed.

But Admiral Feliks Gromov, commander in chief of the Russian Navy, believes that there is no cause for concern.

[F. Gromov, identified by caption, title not given] I cannot be precise, but it is obviously a question of the discharge of low-activity liquid waste which does not affect anything in any way.

[Voznesenskiy] Russia is not in a position to discontinue the discharge of radioactive waste into the sea. In order to do this, all nuclear-powered ships would have to be laid up with immediate effect. The state of radioactive waste storage facilities [video shows concrete shore installations] leaves much to be desired, and there is simply no enterprise to neutralize liquid active mediums. [161903] [video shows extensive views of submarines in dock with various closeups including aerial view of reactor, pan shot of bay, Gromov interview, more closeups of shore installations and view of bay]

Report on Nuclear Waste Dumping at Sea Discussed

*PM1304074393 Moscow PRAVDA in Russian
7 Apr 93 p 4*

[Anatoliy Pokrovskiy article: "They Buried a Problem in the Sea; But What Has Surfaced Is a Real Calamity. Details of Radioactive Waste Dumped Along Russia's Shores Is Made Public for First Time"]

[Text] I arrived in Novaya Zemlya following the detonation there of a nuclear device and the controversial expulsion of a Greenpeace expedition from the island's coast.

"They have no reason to suspect us," staffers at the testing range said at the time, commenting on the two events. "You yourselves have satisfied yourselves that there was

no radioactive fallout after the explosion. But as to what is happening in the surrounding seas—God alone knows."

We now know. On the instructions of B.N. Yeltsin, a commission led by A. Yablokov, the Russian president's counselor on questions of ecology and health protection, has prepared a detailed report on the dumping of radioactive waste in the seas surrounding Russia. I will immediately state my reservations: The report is far from full despite its detail, as it is impossible not just to take into consideration but also to obtain all the necessary facts straight away.

For example, in Novaya Zemlya's Chernaya Bay there have been detonations in connection with the study of the possibility of destroying ships in closed bays. It is simply unknown what fell to the bottom of the sea after these experiments.

To have a fuller picture of what man is doing with the oceans which were given to him for his pleasure, I must remind you that it was the United States which carried out the first dumping of radioactive waste at sea, in 1946 some 80 kilometers from the Californian coast. Subsequently, with the growth of atomic power engineering and the nuclear industry, another 10 or so countries joined us. You can add to these accidents aboard nuclear submarines and bombers carrying nuclear munitions which have gone down in the sea. For example, the American submarines Thresher and Scorpion went down in areas of intensive ship traffic and fishing. In general the data which 12 countries have presented to the International Atomic Energy Agency [IAEA] do not give an exhaustive picture of the nuclear waste which has been dumped in the sea.

But even against this unsightly background, we certainly do not present a good example. I must remind you that as a result of a series of international agreements the following basic demands concerning the dumping of nuclear waste in the oceans have been produced: They should be left beyond the continental shelf no closer than 200 miles from the shoreline at a depth of no less than 4,000 meters, and only in areas between a latitude of 50 degrees north and 50 degrees south. In formal terms the USSR Council of Ministers adopted a special decree on preventing the nuclear contamination of the seas on the basis of international demands back in 1979.

Let us now see how things stand in actual fact. Of the waters close to Russia, it is only those in the northwestern part of the Pacific Ocean which satisfy all these demands. Meanwhile, there are 13 reactors in operation on Russian icebreakers, and as many as 394 on naval ships. In the course of their use, 20,000 cubic meters of liquid radioactive waste and up to 6,000 tonnes of solid waste is produced every year. Seamen, especially military seamen, did not and do not have at their disposal the technical means to reprocess it and the capacity for coastal protection to the necessary degree. The seamen just suffered their problem and began to discharge, to dump their radioactive waste into their own natural environment, not in the places where they were supposed to do so but where it was most convenient. It is known that, for example, just in Novaya Zemlya's bays and in the Novozemelskaya Basin of the Kara Sea six reactors containing spent nuclear fuel and one

unit from the icebreaker "Lenin"'s power plant have been dumped. True, as a rule they were sunk in metal containers or inside barges and lighters. But who knows what will happen as a result of corrosion?

Fortunately, the detected level of radioactive contamination in the seas of the North and Far East does not as yet demonstrate a dangerous increase in the amount of radionuclides in the sea from liquid radioactive waste. It is harder to talk about solid waste as there is no accurate information about the level of danger from the radioactivity in it and the results of corrosion. Let us therefore examine the situation on the basis of two accidents in different regions for which quantitative assessments can be made.

Up until now few people have known that in 1985 in Chazhma Bay in the Far East a reactor exploded in a submarine which was under repair. Some 10 people died and 49 contracted radiation sickness of varying degrees of seriousness. Fission products were deposited in the bay at a distance of 50-100 meters around the craft. A radiation hotspot formed at the bottom of the bay which is now moving toward its entrance. There is one way of getting rid of it completely, which, unfortunately, is very difficult to carry out: to remove the entire layer of silt from the bottom.

Some four years later, at the other end of the country, the nuclear submarine Komsomolets, as is widely known, sank. Fortunately, before it sank, they succeeded in covering the nuclear fuel in a sealing compound based on furfural. Specialists consider that this is enough protection for 500 years. On the other hand, another calamity is becoming apparent.

Investigations have established that nuclear torpedo casings are in contact with sea water. We can expect plutonium-239 to begin to seep into the sea by 1995-1996, when corrosion has taken hold. And it is capable of forming a permanent contamination zone.

At the moment we can see three ways of avoiding danger. The first is to raise the submarine. This most complex of operations will cost at least \$250 million; what is more, damage to the hull may make it absolutely impossible to carry out. The second is to pump into the depths a gel containing a substance absorbing heavy metal salts so that the vitreous substance which forms will prevent a release of radionuclides into the environment. Finally, the third is to only raise the bow of the craft with its torpedo equipment.

As you see it costs the people dearly both financially and from the point of view of their health to simply get rid of the nuclear problem later on. It is not for nothing that public opinion tends more and more toward banning radioactive waste being jettisoned into the ocean. As yet we have taken a first step in this direction by putting in the public domain information which was secret before. It looks as if Greenpeace now no longer has to approach our borders stealthily. Its future program is as yet fairly fluid: constant monitoring of the state of the seas surrounding Russia and elaborating ways of getting rid of radioactive waste at the international level. This matter is complicated

from a technical, economic, and political point of view. But, as they say, health is the most valuable commodity.

Closed Government Session Discusses Environmental Issues

LD0804173793 Moscow Russian Television Network in Russian 1900 GMT 7 Apr 93

[Video report by D. Pugacheva; from the "Vesti" newscast]

[Excerpts] Journalists were not admitted to the Russian Government session today; the only thing they were allowed to do was to list the top officials present, even though the themes of the conference—support for small- and medium-scale businesses and issues relating to environmental protection—are of interest to many residents of Russia. [passage omitted]

Also today, the government ratified the international convention on the protection and use of running water sources and lakes located in more than one country. Luckily for poor Russia—or, perhaps, unluckily—this convention does not envisage any sanctions for polluting water sources.

[Begin Viktor Danilov-Daniyan, minister of the environment and natural resources, recording] if you compare the sum total of cross-border pollution, Russia is the suffering side, not the one that causes suffering. At the moment, we are getting worse pollution from Kazakhstan and from Ukraine than we pollute them. [end recording]

Council of Ministers Presidium Discusses Environment

OW0704144693 Moscow INTERFAX in English 1403 GMT 7 Apr 93

[Following item transmitted via KYODO]

[Text] The presidium of the Russian Council of Ministers discussed April 7 numerous environmental conservation measures proposed by Viktor Danilov-Danielyan, Environment and Natural Resource Protection Minister.

The minister said that the existing division of labor between Russian agencies responsible for the use of natural resources and ecology did not assure the preservation of specific natural resources or consistency of technological policy in this field.

Danilov-Danielyan suggested setting up a system of state bodies headed by his ministry which would supervise federal hydrometeorological, water utilization, forestry, and other services.

ROK Concerned About Sea Contamination From Nuclear Waste

LD0804055993 Moscow ITAR-TASS World Service in Russian 1355 GMT 7 Apr 93

[By ITAR-TASS correspondent Ivan Zakharchenko]

[Text] Seoul, 7 Apr—South Korea is planning to conduct an investigation into the level of contamination of the waters around the country this month following the recent publication of facts concerning the dumping of nuclear waste from the Pacific Fleet of the former Soviet Union

into the sea. A governmental group to organize investigative work and develop defense measures against possible radioactive contamination was formed at a government conference, which took place today.

An ITAR-TASS correspondent was told at the ROK Foreign Ministry that representatives of the foreign political department, the security services, and the ministries of science and technology and environmental issues had taken part in the conference, as well as a range of state directorates connected with the sea and the country's oceanology institute. They analyzed the information contained in the Russian Government "White Book," published earlier this month, on burying radioactive waste underwater and decided to carry out independent work on establishing the seriousness of the possible contamination, which could affect the eastern seaboard of the Korean peninsula. South Korea also hopes that joint investigations of the issue can be held with Russia: this was suggested to the Russian Government last month. Seoul has expressed its concern to Moscow, via diplomatic channels, over information in the press on radioactive waste from Soviet ships in the region and demanded that measures be taken to put a stop to such practices.

Government Efforts To Support Environmental Enterprises, Use of Resources

*LD0704162793 Moscow ITAR-TASS in English
1525 GMT 7 Apr 93*

[By ITAR-TASS correspondent Ivan Ivanov]

[Text] Moscow April 7 TASS—The Presidium of the Council of Ministers of the Russian Federation has considered problems of the environmental protection today. It has approved on the whole measures of economic stimulation in this sphere, considered the possibility of creating a system of fully empowered state bodies of the Russian Federation in the field of ecology. The Presidium has also adopted a convention on the protection and use of trans-frontier water bodies and international lakes.

Viktor Danilov-Daniliyan, minister of environmental protection and natural resources, proposed to insert a number of alterations and additions into the texts of laws of the Russian Federation on taxation which would guarantee the economic interest of enterprises in the improvement of the environment, rational use and reproduction of natural resources.

According to Viktor Danilov-Daniliyan, the proposed system of fully empowered state bodies of the Russian Federation will include the Ministry of Environmental Protection and Natural Resources, the federal service on hydrometeorology and environment control, the federal service of woodland resources, the committees for water conservation, for land resources and land-utilization system, for geology and the use of bowels of the earth and fishing. They should ensure comprehensive regulation of the use of natural resources and a single state ecological policy on the territory of the Russian Federation. Actually, the course towards separating supervision- and-control environmental protection bodies from natural resources users will be implemented, the minister said.

Not all participants of the Presidium of the Council of Ministers supported the concept of creating such a system. The gist of their objections was it is not necessary to wreck the existing system of environmental protection, first of all a sectoral one. Besides, over the last two years this may become the third reorganization of the system of environmental protection. It was decided to send the documents on the organisation of a new system to subjects of the Russian Federation for coordination and further elaboration.

Speaking at a news conference today, Viktor Danilov-Daniliyan said that "in 1992 expenditure for the ecological activities amounted to two billion roubles. The same sum was spent in the period from 1987 to 1991." However, now it will be necessary to spend three or four times more for these purposes, according to experts' estimates.

White Book Report: Nuclear Waste Dumping Into Seas Continues

*OW0204175793 Moscow INTERFAX in English
1636 GMT 2 Apr 93*

[Following item transmitted via KYODO]

[Text] The greatest potential environmental threat is posed by dumping reactors from nuclear subs and parts from the nuclear ice-breaker "Lenin" in the shallow bay of the Novaya Zemlya archipelago of the Kara Sea. This conclusion is made in the White Book on Facts and Problems in the Dumping of Nuclear Waste into Seas Surrounding Russian Territory, which was presented by a governmental commission to journalists in Moscow Friday [2 April]. The commission was made up of officials from the Defense, Health, Foreign and Atomic Industry Ministries and other interested agencies, all which had for six months analyzed the problem under order from President Boris Yeltsin.

The White Book suggests that the Russian navy will have to continue dumping liquid radioactive waste (RW) into northern and far-eastern seas, while the dumping of most dangerous, solid, waste has, according to Vice-Admiral Viktor Zolotukhin, practically ceased.

Captain 1st Rank Oleg Petrov, chief navy radiologist, said that the RW dumped in Russian seas does not seriously affect the health of the population or the environment. This is consistent with the findings of a joint Russo-Norwegian project in the Barents Sea where the nuclear-powered Komsomolets submarine sank.

The commission members told journalists that most nuclear reactors dumped in the Kara Sea are designed to remain safe in hermetically sealed containers for 500 years. In this context the journalists noted that the White Book admits absence of radiation monitoring in the solid RW dumping grounds for 25 years and concluded that nobody can rule out the possibility of leakage from the containers.

In the words of Grigory Berdennikov, Deputy Foreign Minister, in making this report public the Russian authorities "would not like to frighten the world but to contribute to developing a set of measures to counter the hazards of radioactive dumps."

White Book Report: Nuclear Waste Dumping Said To Be Understated*MK0304114293 Moscow NEZAVISIMAYA GAZETA in Russian 2 Apr 93 p 1*

[Andrey Bayduzhiy report under the "Security" rubric: "Another Environmental Mystery Solved. Nuclear Fleet's Continued Operation Getting Dangerous"]

[Excerpts] On the evening of 2 April, a report entitled "Facts and Problems Related to the Dumping of Radioactive Wastes in the Seas Surrounding the Russian Federation" was unveiled at the Foreign Ministry press center by representatives of a number of nature conservation and "power" ministries. Those who drew up the report, however, prefer to call it a White Book, whereas journalists and environmental specialists have already christened it "the last secret of the former USSR." [passage omitted]

According to available official documents alone, since 1959 up to the present time the USSR and, later, Russia have dumped in northern and Far Eastern seas surrounding their territories radioactive wastes of a total yield of 325 kilocuries. These data, however, are far from exhaustive and, according to specialists' estimates, the upper limit of the dumped wastes' yield may reach 2,500 kilocuries. For comparison purposes, the activity of the reactor and the contents of nuclear ammunition of the Komsomolets nuclear submarine that sank in April 1989 did not exceed 151 kilocuries. The most hazardous among the radioactive dumping sites is the dumping ground off Novaya Zemlya. The reason for this is that from 1965 through 1981 a part of the reactor of the Lenin icebreaker and six reactors of nuclear-powered submarines still containing nuclear fuel were dumped in the shallow waters—some only 20 meters deep—around that island. As for the Komsomolets, the main danger posed by this submarine is that the area where it sank is one of the most biologically productive ones in all the world's oceans. In light of that, the possible uncontrolled surges in the release of plutonium-239 by the disintegrating nuclear torpedoes, which, according to scientists may be expected to start as soon as 1995 or 1996, will result in the radioactive pollution of fish caught there and will cause immense economic damage.

As for the "organized" dumping of radioactive wastes, it has been continuing up to the present time. In 1992, seven such cases were reported, of which the most significant one is the submersion of a tanker carrying solid nuclear wastes in an area of the Sea of Japan. Experts note that in the near future Russia will not be able to entirely give up the use of the world's oceans as a radioactive dumping ground. The prime reason for this is that a number of problems related to the utilization of wastes produced by the nuclear fleet and spent reactor compartments of nuclear submarines remain unresolved. At present Russia operates a total of 235 nuclear-powered ships, the vast majority of which belong to the Navy. Those ships operate 407 reactors, which account for 60 percent of the total number of such shipboard reactors worldwide. The operation of these produces annually up to 20,000 cubic meters of liquid radioactive wastes and 6,000 tonnes of solid radioactive wastes. The available temporary storage sites are overfull, and some radioactive materials are being simply accumulated in the open. All this has already made further

operation of the nuclear fleet dangerous. What is most important, however, is that Russia is unprepared to entirely stop dumping radioactive wastes into the sea at least until 1997 when waste processing facilities are to be put into operation.

The publication of the report is a significant, albeit only the first, step toward revealing the true status of radioactive pollution of Russia's coastal waters. The next stage should involve a survey of dumping areas containing the most hazardous solid wastes, because monitoring of their condition has been nonexistent since 1967. It is worth noting, however, that radioactive wastes dumped by the USSR near its own shores in various years are neither the sole, nor even the most significant source of radioactive pollution of its coastal seas. It is common knowledge that the radioactive wastes carried by the Yenisey and Ob rivers to the northern seas account for several thousand kilocuries. The activity of materials that do not fall into the category of "radioactive wastes" is estimated to add another several thousand kilocuries. The White Book gives no data on materials such as products of nuclear explosions carried out on Novaya Zemlya, radioactive radiation sources that found their way into the ocean, lost nuclear ammunition, and so forth. For instance, the activity of just one radionuclide source lost during transportation near Sakhalin, according to scientists' estimates, is nearly twice as great as that of the Komsomolets' reactor and ammunition. The sources of nuclear pollution have yet to be assessed and accounted for, but this effort may produce even greater sensations.

White Book Report: Admits Past Malpractice in Radioactive Waste Disposal*PM0604112793 Moscow Russian Television Network in Russian 1900 GMT 2 Apr 93*

[From the "Vesti" newscast: Video report by A. Peslyak and V. Belyayev, identified by caption]

[Text] [Announcer] A government commission has put together a White Book revealing information on the underwater burial of radioactive waste.

[Peslyak] The White Book was compiled by nuclear physicists, navy men, medics, legal experts, and some 10 ministries. In the space of three months, information on the burial of liquid and solid radioactive waste in the seas surrounding Russia was collated and presented to Yeltsin, and at his behest to the Russian and world public. The data and facts declassified and published today constitute a continuation of the policy of glasnost, cooperation with the public, and redressing of the mistakes of the past. Since 1959, liquid and solid waste, including nuclear submarine reactors and components from nuclear-powered ships, disappeared into the depths of the northern Arctic and Pacific Oceans. Russia, too, continued this practice in the Barents Sea and the Far East seas until recently. It lied to the International Atomic Energy Agency and failed to impart information on the burial of waste, although 11 countries of the world did do this honestly. It was easier for us to violate international agreements and Russia's own Law on Protecting the Environment, and to deceive the population and "Greenpeace." Temporary waste storage facilities were overfilled, craters and radiation leaks

occurred after explosions on Novaya Zemlya, not to mention the accidents and fires on nuclear-powered submarines in 1985 and 1989. Now we have admitted that the USSR and Russia violated the norms of life and hygiene in the nuclear age. Expiation must follow repentance. But even with intelligent staffers and powerful production units we will never get the radioactive jinni back into bottle single-handed. We need a specialist industry for burying radioactive waste, and we need cooperation with other countries. And we need the truth. [Video shows release of White Book, shots of coastlines and vessels at sea, map of Murmansk region, nuclear-powered ships]

Tomsk-7: Reactor Burial Stories Highlight Ecological Problems

PM0704103593 Moscow Ostankino Television First Channel Network in Russian 2000 GMT 6 Apr 93

[From the "Novosti" newscast: Video report by Alla Gorbunova, identified by caption]

[Text] [200941] [Gorbunova over video of Moscow skyline followed by shots of industrial installation] What has happened is that mankind cannot protect itself from its own inventions. Industrial enterprises are most frequently the causes of ecological tragedies.

Today, 6 April, an explosion occurred at the Siberian Chemical Combine [also known as Tomsk-7]. This resulted in the radioactive contamination of the surrounding territory. [video shows closeup of smokestacks of previously shown industrial installation and other structures]

Also today, the POSTFACTUM agency reported the beginning of the construction of a giant burial site for 27 nuclear submarine reactors. However, the existing method of burial does not guarantee ecological safety.

At a press conference today devoted to ecological issues in Russia, Aleksey Yablokov declared that it is impossible today to discontinue this imperfect practice. The process of the introduction of new salvage methods will take at best several years. He stressed that the Russian Government is interested in cooperation with other countries to resolve this and many other ecological problems.

[A. Yablokov, adviser to the president on ecological questions, identified by caption] We are currently spending around 1 percent of GNP on ecology, on environmental protection. I repeat, 1 percent. This covers all the expenditure. This is so little as to be negligible. We need to spend five times as much. Then there will be an improvement. [201045] [video shows industrial installation, press conference, closeup of smokestacks and other structures, more footage of press conference, Yablokov]

Tomsk-7: State Emergency Committee Dispatches Team

OW0704103693 Moscow INTERFAX in English 1020 GMT 7 Apr 93

[Following item transmitted via KYODO]

[Text] A team from the State Emergency Committee has left for Tomsk-7 to investigate the causes and consequences of an explosion of a uranium solution tank in a

Siberian chemical works. An ad hoc team has also been set up locally. According to the Atomic Energy Ministry, the explosion fell into the category of "a serious incident or a third-level emergency" in the international scale.

Six mobile civil defense units are active in the area. No casualties have been reported because the explosion occurred while the tank was unattended.

The press office of the State of Emergency Committee reported that a preliminary measurement had revealed the radioactive contamination at the explosion site to be 30 mR/h [millireontgen per hour] and, 19 km to the northeast, about 40 mR/h. The contamination is estimated to cover an area of 1,000 hectares.

Military fire fighters from the chemical works who extinguished the fire are now undergoing medical checks. The maximum radiation received by the firemen is 0.6 R [reontgen].

Tomsk-7: Institute Says Cannot Fully Assess Accident

LD0704225093 Moscow ITAR-TASS World Service in Russian 1305 GMT 7 Apr 93

[By correspondent Veronika Romanenkova]

[Text] Moscow, 7 Apr (ITAR-TASS)—Specialists at the Kurchatov Institute cannot give a detailed appraisal of yesterday's accident at the Siberian chemical plant (Tomsk-7), because they do not have full information on the quantitative composition of the solution in the blown-out tank. They believe it contained waste from the chemical processing of fuel composed of uranium of medium radioactivity. At Kurchatov Institute, a Russian research center, it was explained to an ITAR-TASS correspondent that less rigorous rules apply for storage of this type of waste than for radioactive waste which goes through the reactor. Kurchatov Institute was one of the developers of the reactors at the Siberian chemical plant—uranium-graphite industrial reactors, the prototypes of nuclear power station reactors such as the RBMK (Chernobyl type). The institute, however, does not have anything to do with the chemical processes taking place outside the reactors. Russia's minister for the environment and natural resources, Viktor Danilov-Danilyan, declined to predict the effects of the Tomsk-7 accident on the environment, explaining that his department does not monitor the environment in industrial areas and that industrial enterprises are individually responsible for any pollution of their territory.

Tomsk-7: Committee Reports Radiation Level Safe

LD0704194393 Moscow ITAR-TASS in English 1919 GMT 7 Apr 93

[By ITAR-TASS correspondent]

[Text] Moscow April 7 TASS—The level of radiation in the zone of spreading the outburst beyond the limits of the Sibirskiy chemical industry complex, which had an accident on Tuesday, does not exceed 400 microreontgen per hour, representatives of the Russian State Committee for Emergency Situations told a news conference in Tomsk-7

today. According to experts' estimates, the area of radioactive contamination is 200 square kilometers and includes part of the industrial zone of the chemical complex, a tract of forest and part of a highway. There are no permanent residents in the zone of increased radioactivity.

The only inhabited locality—Georgievka settlement, situated 22 kilometers from the chemical industry complex, has a radiation background level of 35 microroentgen per hour while a natural radiation background level is 12 microroentgen per hour which is not dangerous to the health of twenty residents. An emergency group carried out disactivation of the highway bringing radiation down to a safe level.

According to data reported by the representatives of the Russian State Committee for Emergency Situations, the level of radiation in Tomsk and other populated localities does not exceed a natural background level.

Tomsk-7: Radioactive Traces Stretch Out 8 Km After Accident

*OW0704172893 Moscow INTERFAX in English
1645 GMT 7 Apr 93*

[Following item transmitted via KYODO]

[Text] Inspectors from the Russian State Atomic Administration report that the explosion of a container of radioactive materials at the Sibirsk Chemical Center on April 6 has caused radiation traces in an area up to 8 km long and 1 km wide.

The maximum radiation in the contaminated area is 400 micro roentgens per hour, at a distance of 1.5-2 km from the site of the explosion. The radiation level on the territory of the Sibirsk Chemical Center is 180 micro roentgens per second.

A working commission is working at the center in conjunction with representatives from the State Atomic Administration. No one has been severely contaminated.

Explosion in Tomsk-7 has not Influenced Radiation Situation in Novosibirsk

Valeriy Bayev, chief of civil defense headquarters' operative section in the Novosibirsk province, reported to Interfax that as of 15:00 local time on April 7, the radiation situation in Novosibirsk has not changed in comparison with its everyday level, 10-15 microreontgen/hour. In Bayev's words, the radioactive cloud, formed as a result of an explosion of a tank with radioactive materials on April 6 in Tomsk-7, has not moved in the direction of Novosibirsk. The distance between two cities constitutes 250 kilometers.

Bayev indicated that the explosion at the chemical complex in Tomsk-7 can be compared with the explosion in Chelyabinsk in 1977. According to the Novosibirsk civil defense headquarters, at 5:00 Tomsk time the radiation level in Tomsk-7 constituted 160 microreontgen/hour. However, the leader of headquarters has said that according to the Tomsk sanitary-epidemiological service, the radiation level exceeds the above mentioned number by several times.

Tomsk-7: Contamination Extends Beyond Enterprise's Territory

*LD0704142693 Moscow ITAR-TASS World Service
in Russian 1349 GMT 7 Apr 93*

[By ITAR-TASS correspondent Anna Bakina]

[Text] Moscow, 7 Apr—The radiation contamination which resulted from yesterday's blast at the Siberian Chemical Combine (Tomsk-7) has gone beyond the bounds of the enterprise's territory. The radiation level within a 1.5 kilometer radius of the epicenter of the blast was 3-4 milliroentgens per hour today. The ITAR-TASS correspondent was told this today by the Ministry of Ecology.

The radiation cloud is moving away in the direction of unpopulated territories. According to the latest figures, a radioactivity reading of 0.4 milliroentgens per hour was recorded 29 kilometers along the road between Tomsk and Samuski. Specialists from the Ministry of Ecology consider that it is still difficult to talk about the future spreading of the radiation, as the taiga conditions prevent more intensive work being carried out.

Aleksey Yablokov, the Russian president's adviser on ecology, considers that the pollution, which has spread over an area of 1,000 hectares "will remain forever". Speaking in a conversation with an ITAR-TASS correspondent, he did not rule out the possibility of similar accidents happening again in Russia, even in the immediate future.

WESTERN REGION

Moldova: EC Mission Discusses Environmental Protection Issues

*AU0704111393 Bucharest ROMPRES in English
0731 GMT 7 Apr 93*

[Text] Chisinau ROMPRES 7/4/1993—A mission of the EC Commission arrived in Chisinau to discuss with the Environment Protection and Natural Resource Department of the Republic of Moldova the program of action for environmental protection in Central and Eastern Europe, MOLDOVA PRES reports. They analyzed the ways of implementing the program in the Republic of Moldova, together with representatives of the Ministries of the Economy, Foreign Economic Relations, Agriculture and Food, Health and of the National Bank.

Ukraine: Eighteen Level 0 Incidents at Nuclear Power Stations in March

*AU0604155293 Kiev HOLOS UKRAYINY in Ukrainian
2 Apr 93 p 5*

[Official statement by the Public Relations Service at Ukraine's State Committee for Atomic Supervision: "Safety at Atomic Electric Power Plants: The March Panorama" issued in Kiev; date not given]

[Text] During March, 18 incidents were recorded at Ukraine's nuclear power stations [AES]. They were individual failures of equipment and the technological and

electrical systems. Seven of them took place at the Zaporizhzhya AES, four at the Chernobyl AES, three at the South Ukrainian AES, two at the Rivne AES, and two at the Khmelnytsky AES.

Since these incidents only led to a reduction in electricity production and did not cause any violations of the restrictions or conditions for their safe exploitation, they were estimated as level zero incidents on the international scale.

The development of international ties is also contributing to the reliability of nuclear power engineering. A group of foreign experts worked for two weeks at the Khmelnytsky AES as part of a specialized mission of ASSET [expansion not known] under the auspices of the International Atomic Energy Agency. Proceeding from a comprehensive analysis of the entire exploitation practice since the day the station went on-line, they prepared and submitted for use specific recommendations for eliminating the basic causes of the most significant incidents and thus preventing future occurrences.

A meeting with a delegation of the Canadian Commission for Nuclear Energy Control was held at the State Atomic Supervision Commission. A memorandum was signed on the main trends for further cooperation and on providing corresponding assistance to the Ukrainian side.

The following were categorized as priority tasks: Cooperation on questions of regulating safety at fuel-cycle and nuclear fuel transportation facilities, the treatment of radioactive waste, the utilization of radioactive isotope sources, the accident-free utilization of the AES, the creation of a National Crisis Center, the normalization of the accounting for and control of nuclear materials and their physical protection, and so on.

In order to implement the coordinated program for interaction, the Canadian partners will finance the supply of computers, organizational equipment, communications systems, radio and spectrometry equipment, will organize advanced training for Ukrainian specialists, and will provide assistance in preparing expert analyses of licensing and inspection procedures and accurate documentation.

Ukraine: Waste Build-Up May Result In Reactors' Stoppage

*LD0504102693 Kiev Radio Ukraine World Service
in Ukrainian 0500 GMT 5 Apr 93*

[Text] The problem of processing and storing waste fuel is one of the most acute problems of nuclear power engineering in Ukraine. Since the beginning of 1992, not a single container of nuclear waste has left Ukraine for the Russian city of Krasnoyarsk for processing, as used to be done earlier. This was stated by (Volodymyr Velnykov), director of the Zaporozhye nuclear power station. He stressed that if the situation does not change, nuclear reactors will soon have to be stopped.

[Word indistinct] stressed that the schedule of transporting waste fuel from our state to Russia was agreed with specialists of Russia's [words indistinct], and an agreement was reached on creating in Krasnoyarsk a special enterprise up to world standards incorporating all [words indistinct]. Unfortunately, a settlement of this problem is now

(?blocked) by the Russian parliament's ecology commission, even though there exists a relevant interstate agreement between Ukraine and Russia, the director of Zaporozhye nuclear power station believes.

Ukraine: Consequences of Closing Chernobyl Viewed

*LD0504173893 Moscow Mayak Radio Network
in Russian 1350 GMT 5 Apr 93*

[Text] Chernobyl nuclear power plant workers will be prepared, in technical terms, to fulfill the resolution of the Ukrainian Supreme Soviet on stopping the operation of the station this year. This was stated to journalists by (Nikolay Sorokin), director general of the Chernobyl Nuclear Plant Association. At the same time, he drew newsmen's attention to the fact that, following the closure of the station, Ukraine will inevitably lose several thousand nuclear specialists. Such a loss would deal a tangible blow to any state with well-developed nuclear power engineering, and all the more so to Ukraine, which does not yet have its own experts in this field. Also, Ukraine will be short of energy, to the value of almost \$600 million per annum, according to assessments. Many experts believe that Ukraine's government and Supreme Soviet ought to reconsider the work timetable for the Chernobyl plant, given the changes in the political and economic situation.

Ukraine: Preparations Under Way To Stop Chernobyl Power Station

*LD0604095193 Kiev Radio Ukraine World Service
in Ukrainian 0500 GMT 6 Apr 93*

[Text] To fulfill the decision to stop the Chernobyl nuclear power station in 1993, a temporary boiler house is being prepared for commissioning. It will provide the minimum heat and steam necessary for the fulfillment of nuclear and radiation safety requirements. This was reported by Mykola Sorokin, director general of the Chernobyl nuclear power station production association. He stressed that on 31 March the State Atomic Inspectorate issued permission to unload fuel from the reactor of the second power unit. The station's personnel has started this work.

CAUCASUS/CENTRAL ASIA

Armenia: Over 100,000 Trees Cut Down for Fuel in Yerevan Over Winter

*OW0504184193 Moscow INTERFAX in English
1621 GMT 5 Apr 93*

[Following item transmitted via KYODO]

[Text] Due to the energy crisis experienced in Yerevan this winter, over 100,000 trees were chopped down in the city to be used as firewood. The Yerevan city council reported to Interfax that Yerevan residents continue chopping down trees in order to have reserves for the next winter.

According to Yerevan's chief dendrologist Artashes Manaserian, 30 years would be needed to restore the green cover of the Armenian capital.

Kazakhstan: Neglected Nuclear Waste Problem Revealed

*LD0504225293 Moscow ITAR-TASS World Service
in Russian 1112 GMT 5 Apr 93*

[By ITAR-TASS correspondent Fedor Ignatov]

[Text] Alma-Ata, 5 Apr—An expedition of geologists, which has been carrying out research within the framework of the republic's "Ecology" scientific and technical program, revealed that in Kazakhstan there are about eight million tonnes of waste saturated with radionuclides whose radioactivity approaches 13 million curies and 225 million tonnes with a total radioactivity of 233,000 curies. The most powerful waste was formed as a result of surface and underground nuclear explosions at the Semipalatinsk testing ground and also in the western and southern regions of the republic. The main polluters are the uranium industry mines and enterprises: the Tselinnoye mining and chemical combine, the Prikaspiyskiy mining and smelting combine, and the Ulbinskoye metallurgical works. The same goes for the "Izotop" firm and the Mangyshlak power combine.

The expedition revealed that the waste from the nonuranium ore processing industry is virtually neglected. The upper part of the Karagay, Kulan, Shubarkol, Turgay, and Yubileynoye coal deposits turned out to be highly enriched with radionuclides. Similar troubles are typical for about 15 deposits of rare earth and nonferrous metals. The radioactivity of the seam waters of the oil fields in western Kazakhstan exceeds norms hundreds of times over.

The expedition resulted in the creation of a computer database listing 529 radioactive waste storage and burial sites. The amount of waste has been calculated. A plan to set up a burial system has been mapped out. However, despite the vast unpopulated territories in Kazakhstan, there are few chances of constructing burial sites in the republic. In the opinion of specialists, only the one-kilometer thick layers of sea clay south of Novyy Uzen, the rock salts in the lower reaches of the Chu River, or the Degelen massif in Semipalatinsk Oblast can be used.

The improvement of the environment will depend on the thorough inspection of these places. There are many incidents when building organizations use radioactive crushed stone that is no one's property. But the Geology Ministry has not yet signed a treaty on carrying out this work.

Kazakhstan: Air Pollution Statutes Remain Unfulfilled

*93WN0352A Alma-Ata VECHERNAYA ALMA-ATA
in Russian 8 Feb 93 p 1*

[Interview with A. Shamenov, head of the Kazakhstan Department of Ecology and Nature Use, by VA correspondent A. Volodev, under the rubric "Interview in Response to Readers' Letters"; place and date not given: "Are We Going to Be Taking Deep Breaths?"]

[Text] The health of each one of us depends directly on the kind of air we breathe and water we drink. If the water

situation, its ecological purity, is relatively good in Alma-Ata, the air basin has already been polluted to a nearly critical point, which naturally is cause for great alarm among the city's inhabitants.

In letters to VA, people have been asking about the reasons for this calamity and about what concretely should be done to clean up the air.

Our correspondents met with Atamurat Shamenev, head of the Department of Ecology and Nature Use of the president's apparatus and the Cabinet of Ministers of the Republic of Kazakhstan and candidate of economics, and asked him to respond to these questions from the city's inhabitants.

[VECHERNAYA ALMA-ATA] Atamurat Muraliyevich, over the last 20 years the republic's government has passed a series of decrees and instructions on cleaning up the capital's air basin. Unfortunately, though, the real fruits of its work are not visible for some reason. Why is this?

[Shamenev] All the same, I wouldn't put it quite so categorically. Certainly, as guidelines for action, these decrees have not been a dead weight. After all, practically speaking, for bad or worse, every leader who trembles for his reputation simply must push to put them into effect.

[VECHERNAYA ALMA-ATA] Could you cite the freshest example of such work, not in words but in deed?

[Shamenev] Let me begin with the fact that air pollution is a "gift" to us from the industrial enterprises, the boilers and furnaces of the private housing sector, and transportation. In order for the air to be ecologically neutral, we have to bring in modern technologies, scrubbing equipment, catalytic converters for automobiles, furnaces have to be converted to gas, and we have to find some replacement for smoke-emitting furnaces. In short, we have to get busy with the ecology, which in the given instance comes down to curtailing the release of polluting substances into the surrounding natural environment and cleaning up the area within the city limits.

To be specific, at the S. M. Kirov Plant, technological equipment has been converted to electrical heating. The KVOiT [not further identified] plant has reconstructed its cupola furnace and changed its technology for manufacturing mineral wadding. The production of the Elektrobyt-pribor's plants and of train car repair has been equipped with modern gas-purifying equipment. It is also gratifying that in all of Alma-Ata, eight furnaces have switched from solid or liquid fuel to gaseous fuel. In the furnace bio-complexes of electrical equipment and liquor and vodka plants, installations have been put in for recirculating smoky gases, thus ensuring a reduction in the release of nitric oxides. It is also good that the Kazgazifikatsiya concern has finally completed installing natural gas in apartments in the individual sector. Already built are 194 kilometers of intra-neighborhood gas lines, and 8,607 private houses have switched to gas heating.

[VECHERNAYA ALMA-ATA] However, are people justified in writing to VA that Alma-Ata remains among the regions of Kazakhstan with the greatest atmospheric pollution?

[Shamenev] There is reason for concern. It is alarming that in the year just past, for the first quarter in comparison

with the corresponding quarter of the previous year, the level of atmospheric pollution in the city grew by a factor of two. Registering excesses beyond the allowable concentrations were 44 percent of the tests for nitric dioxide, 30.5 percent for benzopyrene, 26 percent for carbon monoxide, 23 percent for dust, and 12 percent for phenol.

Nor can it fail to disappoint that the executive and environmental protection organs of Alma-Ata and the former republic-level State Committee for Ecology and Nature Use have not taken exhaustive measures to carry out the republic government's decrees of 5 May 1989, within the established deadlines. Of the 33 undertakings outlined by decree for implementation, 8 of the most important have yet to be carried out.

The task of consolidating small departmental auto shops and transferring them to the Transportation Ministry or moving them outside the city has virtually come to a halt. Economic leaders, taking advantage of the lack of control on the part of the local authorities, have virtually ignored the government's decision. Only 2 out of 15 auto shops subject to being moved outside the city have carried out that transformation. Another 5 shops are making plans for their new spaces. At the same time, newly created market structures and joint-stock and small enterprises are acquiring a fleet of motor vehicles located within city limits and even the center of the city.

The city's executive organs are not taking effective measures to stop work at the Asfaltobeton Production Association (PO) asphalt-concrete plant. Instead of constructing a new enterprise in the area of the village of Nikolayevsk, the appearance of a solution to the problem has been created by reducing the capacities for effective production to the volume of asphalt mixture necessary to satisfy the city's needs.

Also in the city the problem of collecting and burying industrial toxic wastes is being resolved very unsatisfactorily. The construction envisaged by decree of a site for the burial of such waste has still not been started due to the lack of a plan, the elaboration of which has been held up because a technology with ecologically clean parameters has not been selected.

Because the necessary funds have not been appropriated, the construction of a laboratory building for an automated pollution monitoring system for Alma-Ata, trolley-bus park No. 4, and trolley depot No. 2 is not under way. The building of a second branch of the Gazli-Chimkent-Alma-Ata gas line and gas stations is also proceeding very slowly.

Kazakhstan's Energy Ministry, State Economics Committee, and Material Resources Ministry and the Kaznefteprodukt concern have not carried out instructions to supply Alma-Ata's energy enterprises with low-ash coal and low-sulfur fuel oil.

[VECHERNAYA ALMA-ATA] And the last question, Atamurat Muraliyevich. Since you have criticized rather sharply those who are not helping to support the cleanliness of the capital's air basin, then you can probably name the most urgent measures that need to be taken in the ecological sphere.

[Shamenev] I think that today it is simply essential for the Alma-Ata municipal administration and Kazakhstan's Ministry of Ecology and Biological Resources to sort out the real reasons for the halt in the implementation of measures to clean up Alma-Ata's air provided for by governmental decisions and to take additional steps to ensure their accelerated implementation. And for Kazakhstan's Energy Ministry, Ministry of Material Resources, and State Economics Committee to provide for the supply to Alma-Ata's energy enterprises of low-ash coal and low-sulfur fuel oil. At the same time, Kazakhstan's Transportation Ministry, Ministry of Material Resources, and State Economics Committee must as quickly as possible create the necessary conditions for reducing the release of polluting substances from all types of transportation by providing the capital with nonethyl gasoline, converting automobiles to natural gas fuel, introducing catalytic converters for internal combustion engines on a wide scale, and further developing public transportation that runs on electricity.

If all this goes into practice, we can say that we will be taking deep breaths.

Kazakhstan: Nazarbayev Becomes Head of World Fund For Aral Sea Rescue

LD0604123393 Moscow Radio Moscow World Service in English 1100 GMT 6 Apr 93

[Text] The Kazakh president, Nursultan Nazarbayev, has become the leader of an international fund for the rescue of the Aral Sea in Central Asia, whose waters reduced to nearly one-half of their original width because of thoughtless economic activity. An annual 140 tons of sand and salt are carried away by winds at enormous distances. The participants, which include Russia, Uzbekistan, Kyrgyzstan, Tajikistan, and Kazakhstan, will contribute to the fund one percent of their GNPs [gross national products] every year.

BALTIC STATES

Latvia: German Firm Offers Free Contaminated Land

WS0804125493 Tallinn BNS in English 1434 GMT 7 Apr 93

[Text] Riga Apr 07 (BNS)—Latvian farmer Ivan Stepanov was offered a chance to import ecologically polluted land, free of charge, courtesy of the German firm BVG, Pavils Raudonis, spokesman for the Environmental Protection Committee, told BNS.

A farmer from the Preili region, Stepanov, came to Riga Tuesday to get Latvia's authorization for the trade. He brought pieces of the land for inspection; he needs the land to fill a sandpit. The land offered by the German firm contains arsenic 50-150 milligrams per kg of land, zinc 1,500-2,500 milligrams per kg of land, and other noxious substances. The land was collected in a port district cleaning.

The contract violates Basel convention, which forbids the import of waste materials.

REGIONAL AFFAIRS

Poland, Netherlands Cooperate in Pollution Monitoring

93BR0433A *The Hague ECONOMISCHE ZAKEN in Dutch 4 Mar 93 p 2*

[Text] On Friday, 19 February, Mr. C.W.M. Dessens, director-general for energy, handed over an environmental monitoring vehicle to Poland at the KEMA [Electrotechnical Materials Testing Organization] in Arnhem. Director Z. Rozewicz accepted the vehicle on behalf of the Polish concern of Energopomair. The monitoring vehicle has been presented to Poland by the Netherlands government within the framework of the Program for Cooperation with Eastern Europe. It will be used in the fight against Poland's air and soil pollution.

The environmental monitoring vehicle was built in Arnhem by KEMA, on the instructions of the Ministry of Economic Affairs. The mobile sampling and monitoring station is the property of the Polish organization Energopomair, which is Poland's equivalent to KEMA. The monitoring vehicle will be used in Poland's electric power stations and heavy industry, in order to determine the magnitude of the pollution and to evaluate the impact of environmental regulations.

Last year, Polish monitoring technicians stayed at KEMA in the Netherlands to learn to work with Western technology and methods. That was also carried out within the scope of the Program for Cooperation with Eastern Europe. One of the Netherlands government's reasons for stimulating environmental control measures in Poland lies in the fact that pollution does not stop at the Polish border. Pollution from tall chimneys can, under certain weather conditions, travel as far as the Netherlands.

EC Proposes 'Environmental Damage Repair' Measures

93BR0450Z *Rijswijk POLYTECHNISCH WEEKBLAD in Dutch 26 Mar 93 p 5*

[Article: "EC Commissioner Wants To Have All Environmental Damage Repaired"]

[Text] Brussels—All environmental damage, whether it occurs as a result of a breach of the law or by mistake, should be repaired. So writes EC Commissioner for the Environment Ioannis Paleokrassas in a memorandum published last week. The EC Commission has since approved the general aims of the document.

According to the Green Paper, the damage which we are doing to the environment is so drastic that we have an obligation to future generations to take urgent measures to repair it. Consequently, the EC is requesting a speedy harmonization of environmental regulations within Europe.

The regulation concerning environmental liability which is being put forward by Paleokrassas is very new. The Green Paper states that every case of environmental damage should be repaired, irrespective of whether or not it is due to an error or negligence. The proposed liability regulation must be applicable in every case, even when there is talk of

guiltless "objective" liability. According to the Commission, the application of this principle will encourage companies to take preventive measures at an earlier stage.

However, there is no agreement on this position within the EC. Nonetheless, Paleokrassas is thinking of concluding the discussions on the fundamental principle in the autumn. That must then lead to the introduction of European legislation.

Green Paper, EC Approves Aims of Proposal For Environment Clean Up

BR0704083893 *Rijswijk POLYTECHNISCH WEEKBLAD in Dutch 26 Mar 93 p 5*

[Article: "EC Commissioner Wants To Have All Environmental Damage Cleaned Up"]

[Text] Brussels—All damage to the environment, whether it occurs as a result of a breach of the law or by mistake, should be cleaned up. So writes EC Commissioner for the Environment Ioannis Paleokrassas in a memorandum published last week. The EC Commission has since approved the general aims of the document.

According to the Green Paper, the damage which we are doing to the environment is so drastic that we have an obligation to future generations to take urgent measures to clean it up. Consequently, the EC is requesting a speedy harmonization of environmental regulations within Europe.

The regulation concerning environmental liability which is being put forward by Paleokrassas is very new. The Green Paper states that every case of environmental damage should be dealt with, irrespective of whether or not it is due to an error or negligence. The proposed liability regulation must be applicable in every case, even when there is talk of guiltless "objective" liability. According to the Commission, the application of this principle will encourage companies to take preventive measures at an earlier stage.

However, there is no agreement on this position within the EC. Nonetheless, Paleokrassas is thinking of concluding the discussions on the fundamental principle in the autumn. That must then lead to the introduction of European legislation.

French, British Fishermen Urge Governments To Negotiate

AU0504132593 *Paris AFP in English 1244 GMT 5 Apr 93*

[Text] Cherbourg, France, April 5 (AFP)—Fifty French and British fishermen urged their governments to undertake negotiations in a dispute over fishing rights in a joint appeal from this French port, where Normandy fishermen burned a British navy flag eight days ago.

The conflict, which focuses on fishing zones near the Channel Islands, escalated last week in the wake of the flag-burning incident and the arrest of a French skipper off Guernsey charged with illegal fishing, who was due to appear in court there Monday [5 April].

Maritime officials here said the joint statement urged both governments to "urgently settle the problem according to the fishermen's wishes".

It said the "fishermen want to work together to continue the dialogue" outlined in a July 10, 1992 agreement on fishing rights around the Channel Islands.

The text was released after some 10 Channel Islands fishermen unloaded their haul of crabs in Cherbourg without incident Monday. They were invited by their French counterparts for talks at the local maritime affairs office where the joint statement was signed, the office said.

France's new prime minister Edouard Balladur plans to meet Tuesday [6 April] with representatives of the country's main fishing and agricultural unions.

The meeting, after only one week in office, is aimed at reassuring these two hard-hit sectors.

France's agricultural and fishing minister, Jean Puech, vowed Friday [2 April] that the government would defend both sectors and review price-ceilings on fish so that unauthorized imports do not penalize the French market.

Michel Mesnage, the captain of a French trawler, the Calypso, was charged Saturday [3 April] with illegal fishing and refusing to obey instructions from Guernsey shipping authorities.

He was released on bail of 2,400 pounds (3,600 dollars) after several hours in custody Saturday, but told not to leave St. Peter Port, Guernsey's main port, pending his court appearance Monday.

The Calypso was first boarded on March 28 by Guernsey fishers protection officials but refused to obey and instead whisked them off to Cherbourg before releasing them. Officials caught up with the trawler again Friday.

French fisherman also burned a British flag on a Royal Navy training ship docked in Cherbourg on March 28, though the Normandy Fishermen's Association has apologized for the incident.

FRANCE

Balladur Tackles Farming, Fishing Issues

AU0604111093 Paris AFP in English 1046 GMT 6 Apr 93

[Text] Paris, April 6 (AFP)—Just one week after taking office, Prime Minister Edouard Balladur on Tuesday [6 April] tackled the country's agricultural and fishing crises that had plagued his socialist predecessors.

He met Tuesday morning, ahead of talks with industry representatives, with concerned government ministers to discuss the two issues and the related question of global trade talks.

As the meeting broke up with no official announcement, hundreds of fruit producers demonstrated outside the Rungis wholesale food market near Paris to protest against cheap imports.

CRS riot police and mobile gendarmerie units were rushed outside France's biggest market before the demonstration

against cheap apple and pear imports from New Zealand and South Africa, and against high social benefits costs.

Balladur, by taking early action on farming and fishing, hopes to reassure producers of his conservative government's support, sources close to the government said.

The farmers have conducted often violent protests for more than a year against E.C. common agricultural policy, which cuts back on subsidies the French agricultural sector says is vital for its survival.

The demonstrations picked up after a lull following a U.S.-E.C. farm trade deal in November, which the Socialist government had promised to veto.

Fishermen have protested since the start of the year against cheap imports from the United States, Scandinavia and former Soviet bloc countries and what they term unfair competition from other E.C. countries.

Agriculture and Fisheries Minister Jean Puech assured fishermen Friday [2 April] that his government will "defend with great vigor the interests of agriculture and fishing—strong sectors essential to the French economy."

But he called on fishermen to temporarily hold back their protests to avoid "any deterioration that would complicate our efforts."

Sources close to the government said France believes the stake, beyond the farm trade talks, is maintaining the E.C.'s identity vis-a-vis the United States, which it accuses of seeking too many concessions without making any itself.

Balladur on Monday [5 April] sent three senior ministers, including Foreign Minister Alain Juppe, to meet E.C. officials in Luxembourg and assure them that France remains committed to Europe—but will stand firm on the farming issue.

GERMANY

German Toxic Waste Smuggled to Romania, Russia

LD0404183693 Moscow Ostankino Television First Channel Network in Russian 1350 GMT 4 Apr 93

[Video report from Romania by correspondent Zheleznyak on smuggling of toxic substances from Germany—from the "Panorama" program]

[Excerpts] [video shows chemical substances labelled "Danger"; village barns where dangerous substances were stored; interviews with local officials; German experts re-packing the chemicals]

Here are the toxic substances in question: Packed in ordinary metal or plastic containers, they were delivered here, into the center of Romania, over a year ago. They were fraudulently delivered here from Germany by private companies, masquerading as varnishes, paint, or pesticides. [passage omitted]

Similar crimes also are taking place in our country. Information available here suggests, for example, that similar waste from Germany was delivered into Russia, using the same channel, but in much bigger quantities. If this is true,

where is it? Anyway, I hope that this report will sound an alarm for our environmental agencies.

IRELAND

Concern Over Pollution From UK Plant Continues Statement Released

93WN0344A Dublin IRISH INDEPENDENT
in English 12 Feb 93 p 5

[Article by Lon Lavery: "Government Warns Over Sellafield Safety Risk"]

[Text] Sellafield's dubious safety record is a key element of the Government's opposition to the British nuclear plant's proposed THORP fast breeder reactor.

The extension would be an "additional and unnecessary risk" to the health and safety of the Irish population—and there is no reason to believe that safety at the new plan will be any more effective than at Sellafield, the government has told the British authorities.

In a strong submission calling for a public inquiry into the opening of the new plant, the Government said the dominant factor in the Irish public's aversion to nuclear power is the risk of a catastrophic accident and the contamination that would ensue.

Energy Minister Brian Cowen yesterday released the document, which also expressed Irish concerns about future shipments of spent fuel and plutonium through the Irish Sea.

Citing the Government's "extreme concern" about the possibility of a serious accident as one of the reasons for the Irish demand for closure of Sellafield, the document said the range of incidents there has been wide.

"Some of these have involved serious releases into the environment, such as iodine-131 and other radionuclides into the atmosphere in 1957; an incident in 1983 which involved a significant release of radioactive waste material into the marine environment around Sellafield which resulted in widespread contamination of adjacent beaches, and other unplanned marine discharges due to plant faults and instrument failures."

The submission added that in a recently widely publicised incident involving the leaking of plutonium nitrate from defective pipework, initial indications from BNFL were that it was a "minor" incident requiring a three-day shutdown.

However, it subsequently transpired that the incident was rated as serious and caused the reprocessing plant to be halted for several weeks, the government document said.

"These incidents, together with a large number of lesser incidents which have occurred at the Sellafield plant, have only served to increase Government and public concern in Ireland about the adequacy of safety in the reprocessing industry and BNFL's ability to manage such a hazardous industry. There would seem to be no reason to believe that safety at the THORP plant will be any more effective."

The Government also expressed its concerns about plutonium proliferation if the plan went into operation.

The submission, noting the accidents at Chernobyl and Three Mile Island, said the expectations of 50 years ago that nuclear energy would be cheap, clean and safe were "over optimistic and have proved unattainable."

Recent Leak No Risk

93WN0344B Dublin IRISH INDEPENDENT
in English 17 Feb 93 p 9

[Article: "Sellafield Leak 'No Health Risk' Here"]

[Text] The latest radiation leak from Sellafield poses no risk to health here but the situation would be kept under constant review the country's nuclear watchdog said yesterday.

A full investigation into the incident in which about one gramme of nuclear dust was released at a disused plutonium plant in Sellafield last week is under way.

The leak was discovered on Thursday at 3 pm at a plutonium purification plant which was closed down during the 1980s and is being dismantled, but the British Ministry for the Environment was not informed until 24 hours later.

The British Government has said that only a small amount of dust was released causing no harm to people or the food chain.

Mr. John Cunningham of the Radiological Protection Institute in Dublin said that while it was not expected that the discharge would be detected in Ireland, the leak was to be condemned.

"The amount released will have no effect here but we must continue to deplore the continued uncontrolled leaks which have occurred at the Sellafield plant," he said.

The Green Party welcomed the protest to the UK government by Energy Minister Brian Cowen but said they were not convinced the leak would have no effect on human health.

Mr. Cronin's claim that the equipment used by the Radiological Protection Institute was unsatisfactory because it only detected gamma particles in aerial discharges, as opposed to alpha particles, was rejected by the Institute.

Louth TD. Dermot Ahern said that despite the best efforts of a number of people over the week-end, information regarding last Thursday's "serious" leak was not readily available.

Deputies on all sides of the Dail protested last night about the leak and called for further contact between the Irish and British governments.

The protests were led by Des O'Malley (PD), Theresa Ahern (FG) and Eamonn Gilmore (DL).

NETHERLANDS

State, Chemical Sector Agree on Emission Levels
93BR0423A Rijswijk POLYTECHNISCH WEEKBLAD
in Dutch 19 Feb 93 p 3

[Article: "Environmental Pact Between Government and Chemical Industry; Chemical Sector for the Time Being No Longer Has the Government's Breathing Down Its Neck"]

[Text] The Hague—The Netherlands chemical industry last week concluded a major environmental pact with the government. The chemical sector has committed itself to rigorous emission reductions until the year 2000, which will require an investment of 10 billion Dutch guilders. The government for its part has agreed to adopt a consistent environmental policy.

The agreement is a direct follow-on of an intent that had already been expressed in the National Environmental Policy Plan in 1989. After about three years of discussion, it has led to an extensive agreement: "Statement of Intent on the Implementation of an Environmental Policy in the Chemical Industry." The idea is that if the chemical sector voluntarily improves its environmental behavior, it will not be bothered by the government breathing down its neck. The agreement does not only involve the Ministry of the Environment, but also the Ministries of Economic Affairs and Transport and Public Works. The other signatory to the agreement is the Netherlands Chemical Industry Association (VNCI).

Great Differences

The understanding which has now been reached includes, among other things, measures which by 2000 should lead to a 70-percent reduction in acid emissions by comparison with the 1985 level. In addition, commitment has been made to substantial reductions (ranging from 50 to 90 percent) in heavy metal discharges.

Deviations from the agreements made in the pact are permitted when specific European environmental agreements differ greatly from those included in the National Environmental Policy Plan.

The VNCI has expressed its satisfaction with the pact. In particular, the long term period which it covers is felt to be a good point. Over the last few years, the country's chemical industry has felt rather apprehensive about the arbitrary, inconsistent policy under which the government was always breathing down the industry's neck. It now hopes that things will be straightened out with the recent pact.

A spokesman for the VNCI expressed himself to be happy with the "integral approach to all aspects of the environment," as it is stated in the pact, and with the additional condition that the measures to be taken by industry must be able to stand the test of technical and economic feasibility.

Growth Expectation

The promise of a consistent government policy has encouraged industry to commit itself to additional investments over the next eight years. These joint investments by the companies must reflect the aims of the National Environmental Policy Plan.

The environmental investment requirement anticipated for the next 10 years is not based on a specific investment plan, but on a projection of the present environmental investment level increased by an expected growth factor. (In 1991, the chemical industry invested a total of 4 billion Dutch guilders, of which 900 million was directed toward

the environment. For the coming years, however, environmental investments are expected to average 1.2 billion per year.)

Biological Flue Gas Desulfurization System Implemented

BR1404114593 Rijswijk POLYTECHNISCH
WEEKBLAD in Dutch 2 Apr 93 p 3

[Article by Gerard van Nifterik: "Biological Flue Gas Desulfurization System Gets Chance in Geertruidenberg"]

[Text] Balk—At the end of June, the Amercentrale power station in Geertruidenberg will launch a pilot project for a new type of flue gas scrubbing. It involves a biological process, developed by Paques BV., which will remove sulfur from the smoke produced by the coal-fired power station.

"It will be 30 percent cheaper," claims Dr. Engineer C.J.N. Buisman of the environmental technologies company Paques BV., located in Balk. "The process is about 30 percent cheaper than the conventional gypsum-based method. Not to mention the problems related to disposing of the gypsum, which has to be dumped somewhere, whereas the sulfur residue from our process simply can be sold."

In collaboration with Hoogovens, and financially backed by the Northern Development Company (NOM), Paques developed a process for removing the sulfur from the washing water in scrubbing plants. The only residue from this biological method is saleable elementary sulfur.

The biological desulfurization of waste water is nothing new, but the desulfurization of washing water using the Paques method certainly is. The Paques method also requires very different process circumstances. The temperature of the waste water—about 50 degrees Celsius—is much higher than that of normal waste water. Its salt content, mainly NaCl, also is relatively high, which seemed reason enough to adapt the existing principle of desulfurization to the extreme washing water circumstances.

Those involved in the project have since developed a process provisionally known as Bio-FGD (flue gas desulfurization). This is a multistage process in which the washing water from the scrubber is first anaerobically purified in a Biopaq IC reactor, where the sulfur dioxide is converted into sulfide. The next aerobic step, in a Thiopaq reactor, turns this into elementary sulfur, which is purified before being sold.

Laboratory results will be confirmed from the end of June onwards. A pilot plant will be set up at the coal-fired power station in Geertruidenberg. It will handle approximately 4,000 cubic meters of flue gases per hour—1 to 2 percent of the station's total emission level. If everything goes according to plan, the system's capacity will be increased after a year of experimental operation.

NORWAY

Kvaerner Energy Leader: End of Hydropower

93EN0297A Oslo AFTENPOSTEN in Norwegian
23 Mar 93 p 15

[Letter on op-ed page by Tore Amundsen, CEO, Kvaerner Energy: "Last Gasp for Norwegian Hydropower?"]

[Text] The government is about to write the death sentence for one of Norway's strongest industrial branches. Tens of thousands of jobs will be sacrificed under the slogan of "Let the river live." This is not an operational mistake. This is a conscious and willful policy. Only the Storting can now stop the madness.

It has to do with the new protection plan for waterways that the government will soon present to the Storting. Here there are proposals for the protection of another 127 waterways in addition to the 195 that have been protected in previous plans.

If the new protection plan is approved, a very large number of Norwegian rivers will not be able to be used in the future to deliver clean energy to the country which today sends millions of tons of carbon dioxide and sulfur into the atmosphere. We get this pollution back in Norway in the form of acid rain, forest death, and empty fishing waters. The rivers that are to be saved from power plant extension will be killed by air and water pollution.

With the protection flag hoisted high, Gro Harlem Brundtland and Thorbjorn Berntsen are running from the environmental initiative Norway has taken internationally. The waterways that the government wants to protect could have provided enough electricity to cover more than Denmark's total consumption. We could have saved nature from the emission of 30 million tons of carbon dioxide. This is over five times more than what the Norwegian car population spews out each year!

Instead the slogans coined by a thoughtless protection policy will eliminate tens of thousands of jobs and many tens of billions in foreign currency income. Development of the waterways over the next 20 years would produce 20,000 jobs each year in the construction, industry, and power plant sectors. With the foreign currency income from power export, the country could finance many common tasks in the social and health sectors. This would produce several thousand more jobs.

The government's proposal for the protection plan will weigh protection interests against other purposes. Protection of waterways is to preserve essential values in nature. Norway's future need for power is evaluated against this. On the other hand, export of power to other countries is not included in the calculation. With the exception of purely excess power and in a short period of time, the government is moving clearly against the export of hydropower.

The government prefers a balance between exports and imports. In plain language, this means that for every kilowatt hour of clean energy from Norway we will get back just as much polluted energy from coal-fired power plants.

It is time to begin a basic reconsideration. Years with much precipitation and mild winters have provided a large power surplus and correspondingly low prices. The cheap sale of Norwegian power to Sweden ends with a profit for the Swedes as expensive electricity in Germany. Now we must enter into steady agreements on the delivery of power abroad. We have nothing to lose from such a policy.

Norway has been the leading country in power development. Ninety-nine percent of our electricity comes from hydropower. Even with very strong environmental protection, we can still acquire another 15 percent of the developable water power. In addition, many older power plants can be modernized so that they will produce more power. But the government does not want to take advantage of these possibilities, either, to create more jobs, contribute to a better environment, and ensure essential foreign currency income.

We are the smartest in the world in limiting harm to nature in the development of hydropower. Our hydropower turbines are the world's most effective. Half of all power plants in the mountains are in Norway. We have much to contribute abroad as well.

The world has enormous hydropower resources that have not been developed, particularly in the undeveloped countries. The government's death sentence on continued hydropower development in Norway will seem incomprehensible for them, and there is the danger that they will depend upon other, nonrenewable resources for their energy.

Of course we must protect natural values in Norway. But we must also protect the environment on a large scale. And we must protect jobs and living standards. The government's protection plan is completely without a perspective of the world's energy and environmental challenges. It completely underestimates waterways as a resource for the country.

SWEDEN

Johansson Dissatisfied With Climate Proposal

93WN0333A Stockholm DAGENS NYHETER
in Swedish 13 Mar 93 p 5

[Article by Erika Bjerstrom: "Hard To Reduce Emissions"—introductory paragraphs in boldface as published]

[Text] The environmental minister is dissatisfied with the government's climate proposal.

The government has presented its strategy to reduce Sweden's part of the greenhouse effect. Environmental Minister Olof Johansson said he was not proud of the proposal. The measures are not sufficient to meet the seriousness of the situation, he thinks.

"A reduction of carbon dioxide emissions by 60-80 percent is necessary to remove the risks of the greenhouse effect. But no industrialized nation is able to manage this." The measures would have to be taken in several stages, Johansson said on Thursday [11 March] as he presented a climate proposal that was several weeks late.

Negotiations among the government parties took place up to the last minute. In the face of a slow economy, it is difficult to get sympathy for more extensive measures, Johansson said.

The most important news is that Sweden will again have a national goal of freezing carbon dioxide discharge. In the year 2000 Sweden's discharge may not exceed that of 1990. Without a decision to freeze, the discharge would increase by 6 million tons by the year 2000. The last time a decision on freezing was made was in 1988.

But in practice it was torn up in connection with the three-party agreement on energy.

Energy Tax

Another new item is that the government will place an energy tax on new power plants that are fired by oil, coal, and natural gas. The tax will amount to eight ore per kilogram of carbon dioxide.

"The message is that no new power plants are to be built that are run by oil or coal," Johansson said.

Support for Fossil Fuels

"The next step can come as early as next spring. Then I intend to put an energy tax on all power plants that are fired with fossil fuels. But first we must wait for the EC's discussions and hope that they decide to introduce a tax on carbon dioxide," the environmental minister said. He puts great hope in President Clinton in the United States and his intentions to introduce an energy tax in the United States. This should have an effect on the EC, and this in turn would press Japan to introduce an energy tax. Then the deadlock in the international climate negotiations should be broken, Johansson hopes.

To encourage heating with fossil fuels the government will extend the national investment support of power plants that use fossil fuels up to 1997.

On the other hand, there are no norms on how much carbon dioxide vehicles can emit, something that the Environmental Protection Commission proposed.

The government is satisfied with pushing internationally for such norms to come into existence. According to Johansson, it is difficult for Sweden to go ahead of the EC and establish set norms that can be considered to be competition-limiting.

"A Lot of Talk"

In order to introduce environmentally friendly fuels and electric vehicles more rapidly, the government will earmark 15 million in support of the production of ethanol from cellulose and 9 million for the development of electric vehicles.

The Social Democratic opposition dismisses the climate proposal.

"There is a lot of talk but little content, just like the cycling proposal," Peter Larsson, environmental strategist for the Social Democrats, said.

He does not want to specify a Social Democratic plan against the greenhouse effect, but he says that one will appear shortly.

The Environmental Association, which demonstrated outside the Department of Environment and Natural Resources, questioned the government's infrastructure proposal. There are plans to build 700 kilometers of new highways.

"This is incompatible with the goal of lowering carbon dioxide emissions," Eva Andersson said to DAGENS NYHETER.

Environment Seen Harmed by Forestry Policies

93WN0332B Helsinki HELSINGIN SANOMAT
in Finnish 20 Mar 93 p D 2

[Article by Katri Simonen: "Forest Use Must Be Reconsidered"]

[Text] "Finland's forest policy is inferior to those of many developing countries," forester Eero Reinius of the forestry consulting firm, Jaakko Poyry, recently stated at the forest conference in Nuksio.

According to Reinius, up to now Finland's forestry image has been good throughout the world, but now it no longer is.

"We in Finland are still living in the spirit of the 1950's. In those days wood production was the most important thing; now that's not enough. As far as Central Europe is concerned, Finland's forest policy is already becoming a burden for consultants like Poyry. In the developing countries Finland's forestry reputation is still a good one."

Poyry is implementing a new forest policy for developing countries, among them Thailand. Reinius listed the goals of the Thai forest plan: "To put a stop to the destruction of the forests, to protect the remaining natural forests, to make underproductive forests productive, to promote social justice...."

Ensuring wood production comes only after these.

Enduring Forest Economy Is Only a Myth

Finland's forest policy is recorded in the revised report on the Forest 2000 program.

"In it there is no mention at all of preservation of biodiversity, that is, of the principles set forth at the UN Development and Environment Conference," Jukka-Pekka Jappinen, a senior researcher at the Water and Environment Board, said. "Professional foresters criticize the program."

According to Jappinen, the myth of an enduring forest economy has prevailed for a long time in Finland: "In terms of wood production, the forest economy has indeed been an enduring one—the rest of the forest environment has suffered. Forty percent of Finland's approximately 1,700 threatened species are forest organisms."

Among others, an attempt has been made to improve the situation by publishing new guidelines for more natural management of commercial forests.

"At the Agriculture and Forestry Ministry they are now stressing the fact that protection of the natural environment must be actively taken into account in commercial forests. The idea is only part of the truth. Forests used for recreational purposes, gathering berries and mushrooms

aren't necessarily more diverse in terms of the number of plant and animal species found in them than commercial forests," the researcher noted.

According to Jappinen, time should be provided in the forest policy for researchers to survey the forests.

At the present time they do not know how many different kinds of (threatened) forest species there are in Finland—and therefore how large a percentage of them is being or has to be protected. This is cause for many needless disputes.

Many Forest Owners Interested in Protection

"Finland's nature conservation network was created largely for political reasons. Nature conservationists have had to make urgent appeals since forests revealed to be precious are already being cut down," Jappinen said and pondered whether forest improvement funds might be ecologically employed to develop permanent activities.

"Nature conservation is viewed as being hostile to employment, but the biodiversity treaty concluded in Rio obligates the signers to care for and maintain natural species, which would provide jobs. For example, this country's 13 water and environment districts could serve as organizers of jobs," Jappinen proposed.

The new spirit can already be perceived in our forests since 30 percent of Finland's 380,000 forest owners consider their goal to be other than just wood production. The most important thing for 5 percent of them is conservation of the natural environment.

Signed by some 180 countries—Finland included—in Rio in June 1992, the biodiversity treaty recommends that "funds [be set aside] to study, protect, and restore biodiversity," that is, the diversity of the natural environment.

An actual agreement on forests could not be signed at the Rio conference. Finland now aspires to assuming an active role for itself as a leading country in carrying out the work prescribed by the treaty. A forest committee is being formed under the Agriculture and Forestry Ministry for this purpose.

The "leading country" will have to quickly formulate a new forest policy that takes into account the principles of the future forest agreement.

Expert Doubts Country Can Meet Ozone Standard

93WN0332C Helsinki HELSINGIN SANOMAT
in Finnish 21 Mar 93 p 13

[Article by Riitta Vainio: "Spring Sun Is Elevating Ozone Readings of Earth's Surface; Finland's Ozone Level Exceeds Planned Guidelines"]

[Text] In the judgment of special investigator Tuomas Laurila of the Air Quality Department of the Meteorological Institute, Finland cannot comply with the soon-to-be-applied guidelines for ozone levels on earth's surface. Laurila's estimate is based on last year's ozone readings.

Subject to the authority of the United Nations, the Economic commission has issued guidelines for ozone levels close to the earth's surface for this year. As things look right now, a method of calculating levels that affects the

entire growing season is soon to be applied, in terms of which amounts in excess of 80 micrograms would be taken into account.

In Finland an 80-microgram figure exceeds the amount for the entire growing season throughout the country.

Committee Gave Up Trying To Define Guidelines

The harmful ozone at the earth's surface, or lower layer of the atmosphere, is gradually rising to the peak levels of springtime. This week the Meteorological Institute reported that the average hourly level was between 80 and 90 micrograms per cubic meter of air. Last Sunday 110 micrograms per cubic meter were recorded in Virolahti, 90 in Kuusamo, and 60 in Utto. Average hourly levels of from 90 to 100 micrograms were recorded throughout the winter in Northern Finland.

No ozone guidelines have been specified in Finland. The Environment Ministry guidelines committee considered proposing acceptable amounts, but gave up the idea primarily because it is hard to control the amount of ozone at the national level. The ozone is carried to Finland from central and southern Europe, among other sources.

The World Health Organization (WHO) has specified that a level of from 150 to 200 micrograms per cubic meter is harmful to humans. The limit prescribed by the Nordic Council is 150 micrograms, an amount in excess of which is damaging to plants.

Ozone Damages Plant Cells

More ozone is generated in the lower atmosphere than is lost in it. Ozone is a toxic gas that damages plants and is also harmful to humans. Ozone speeds up assimilation in plants and damages cells.

In humans ozone causes rapid aging of the air cells of the lungs. Exertion, exercising in the open air when the ozone level is high, for example, intensifies the harmful effects of the ozone.

The amount of ozone in the lower atmosphere, or troposphere, increases during the spring, depending on the weather. In addition to air pollutants, that is, nitrogen oxides and hydrocarbons, sunlight is needed to generate ozone.

Ozone Over Earth's Surface Doesn't Fill Ozone Hole

Lower atmosphere ozone must not be confused with the ozone layer of the upper atmosphere, or stratosphere, which protects the earth from the harmful rays of the sun.

The lower and upper layers of the atmosphere remain separated from each other and lower atmosphere ozone does not rise to fill the harmful ozone hole that arises in the upper atmosphere.

The amount of ozone in the lower atmosphere has been at its highest in recent years during April pollution episodes because of the increase in air pollutants. The readings may remain high for from a few hours to several days.

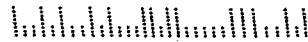
The highest volume of ozone measured last summer was during the first half of June at Tvarmine on Tammisaari, where the average hourly ozone level rose to 187 micrograms per cubic meter.

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